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Datasheet for the decision of 18 June 2015

Case Number: T 0205/14 - 3.3.01

Application Number: 05791142.2

Publication Number: 1713489

IPC: A61K31/663, A61P19/10, C07F9/38

Language of the proceedings: EN

Title of invention:
CRYSTALLINE FORM OF IBANDRONATE SODIUM AND PROCESSES FOR PREPARATION THEREOF

Patent Proprietor:
Teva Pharmaceutical Industries Ltd

Opponents:
Hexal AG
Actavis Group PTC EHF
Pharmathen Industrial S.A.

Headword:
Ibandronate sodium, Form QQ/TEVA

Relevant legal provisions:
EPC Art. 54, 56, 61, 88, 117, 125
EPC R. 52, 53
RPBA Art. 13(1), 13(3)
EPC 1973 Art. 60(1), 60(3), 72, 74, 87
EPC 1973 R. 20

Keyword:
Right of priority - assignment
Main request: novelty (yes), inventive step (no)
Requests AR1-AR5, MRa, AR1a-AR5a: inventive step (no)
Request AR6: admitted (no)

Decisions cited:
G 0001/92, G 0003/92, G 0003/99, G 0001/13, R 0016/09, J 0019/87, J 0012/00, J 0002/01, J 0004/10, T 0595/90, T 1008/96, T 0005/05, T 0062/05, T 0788/05, T 0493/06, T 0382/07, T 1933/12, T 0160/13

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Case Number: T 0205/14 - 3.3.01

D E C I S I O N
of Technical Board of Appeal 3.3.01
of 18 June 2015

Appellant: (Opponent 2)	Hexal AG Industriestrasse 25 83607 Holzkirchen (DE)
Representative:	von Seebach, Malte Maiwald Patentanwalts GmbH Jungfernstieg 38 20354 Hamburg (DE)
Appellant: (Opponent 3)	Actavis Group PTC EHF Reykjavikurvegur 76-78 220 Hafnarfiordur (IS)
Representative:	von Seebach, Malte Maiwald Patentanwalts GmbH Jungfernstieg 38 20354 Hamburg (DE)
Appellant: (Opponent 5)	Pharmathen Industrial S.A. 6, Dervenakion str. 15351 Pallini Attikis (GR)
Representative:	Brown, Andrew Stephen Pharmathen 44 Kifissias Avenue 15125 Maroussi, Athens (GR)
Respondent: (Patent Proprietor)	Teva Pharmaceutical Industries Ltd 5 Basel Street PO Box 3190 49131 Petah Tiqva (IL)
Representative:	Nachshen, Neil Jacob D Young & Co LLP 120 Holborn London EC1N 2DY (GB)

Decision under appeal: **Interlocutory decision of the Opposition Division of the European Patent Office posted on 18 December 2013 concerning maintenance of the European Patent No. 1713489 in amended form.**

Composition of the Board:

Chairman A. Lindner
Members: L. Seymour
L. Bühler

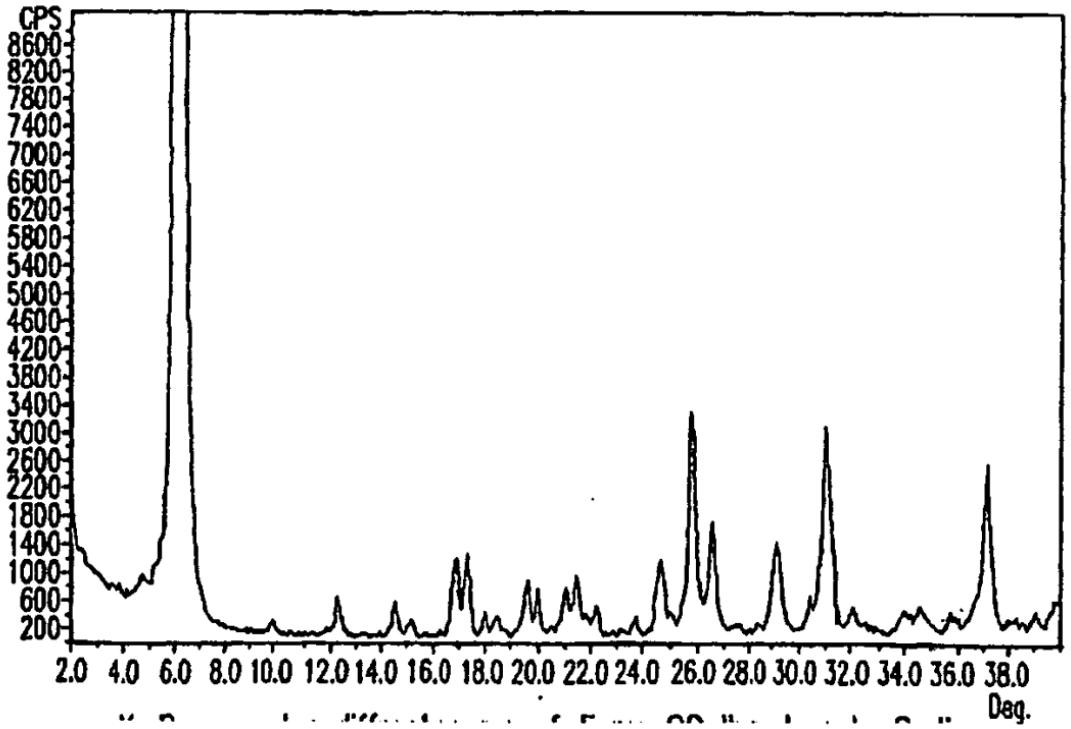
Summary of Facts and Submissions

I. European patent No. 1 713 489 was filed as patent application number 05 791 142.2, based on international application WO 2006/024024, filed on 23 August 2005, and claiming priority from US applications No. 60/604,026 of 23 August 2004 (P1) and 60/690,867 of 16 June 2005 (P2). It was granted with the following claim 1 to 4 and 7:

"1. A crystalline form of ibandronate sodium characterized by x-ray reflections at 6.2, 25.9, 26.7, 31.1, and 37.2 ± 0.2 degrees 2θ.

2. The crystalline form of ibandronate sodium of claim 1, characterized by further x-ray reflections at 16.9, 17.3, 21.5, 24.7, and 29.2 ± 0.2 degrees 2θ.

3. The crystalline form of ibandronate sodium of claim 2 having a powder x-ray diffraction diagram as shown below:



4. A pharmaceutical composition comprising a crystalline form of ibandronate sodium as defined in any one of the preceding claims.

...

7. A process for preparing a crystalline form of ibandronate sodium as defined in any one of claims 1 to 3 comprising the steps of dissolving ibandronate sodium in water to form a solution, maintaining the solution under a saturated environment of acetone, and decanting the solution to obtain ibandronate sodium."

II. The following documents, cited during the opposition/ appeal proceedings, are referred to below:

(2) EP-B-0 252 504

(2a) US-A-4 927 814

(3) S Byrn et al., Pharmaceutical Research, 1995, 12(7), 945 - 954

(4) ICH Harmonised Tripartite Guideline, 1999, Q6A

(5) The United States pharmacopeia, USP 25, 2002, pages 2088-2089, section <941>, X-Ray Diffraction

(30) EPAR (European public assessment report) Scientific Discussion for Bondronat, revision 8, published on the EMA (European Medicines Agency) website on 14 May 2004

(33) WO 2006/081962

(39) Third-party observations dated 29 December 2008

(43) Declaration of Dr. Olaf Grassmann dated 10 October 2011

(52) Experimental report, Gador, "Polymorphism: Sodium Ibandronate Part II"

(53) Experimental report of Pharmathen, dated 21 March 2011

(53a) Experimental report of Pharmathen, dated 29 March 2011

(65b) Letter of appointment and conditions of employment of Ms Revital Lifshitz dated 3 August 1998 and confidentiality agreement dated 16 August 1998

(65c) Terms of employment of Mr Thomas Bayer dated 6 January 2004 and undated confidentiality agreement (Appendix B)

(65d) Letter setting out the conditions of employment of Ms Judith Aronhime dated 16 December 2004, first confidentiality agreement dated 24 April 1994, and second confidentiality agreement dated 19 December 2004 (Appendix B)

(66a) Expert opinion of Mr Tal Band, dated 21 May 2012

(66f) Israel, Patents Law 5727-1967, official translation

(66g) Israel, Patents Law 5727-1967, unofficial translation retrieved from WIPO website, covering amendments enacted until 1999

(67a) Expert opinion of Mr Patrick J. Birde dated 15 February 2012

(67b) Expert opinion of Mr Robert C. Millonig and Ms Gaby L. Longsworth dated 23 April 2012

(73a) Annex A to patentee's letter dated 20 September 2013

(73b) Annex B to patentee's letter dated 20 September 2013

(73c) Stability data annexed to patentee's letter dated 20 September 2013

(74) A Kleeman et al., Pharmaceutical Substances: Syntheses, Patents, Applications, Thieme, 3rd edition, 1999, page 973, "Ibandronate sodium monohydrate"

(75) Decision of the opposition division in respect to European patent No. l 930 011 (based on the divisional application 08 002 626.3 of the application underlying the patent in suit)

(77) Letter of Mr Patrick J. Birde dated 2 June 2014, including as Exhibit 2 the Expert opinion of Mr Tal Band dated 1 June 2014

(79) Federal Supreme Court of Germany (BGH), decision of 16 April 2013, X ZR 49/12, "Fahrzeugscheibe"; see also GRUR 2013, 712

(80) Declaration of Dr. Christian Lehmann dated 14 May 2015

III. The appeals lie from the interlocutory decision of the opposition division maintaining the patent in amended form based on the main request filed with letter of 20 September 2013. The claims of this request differ from those as granted in the deletion of claims 5 and 6 and renumbering of claim 7 (cf. above point I).

IV. Opponents 2, 3, 5 each lodged an appeal against this decision, and filed statements of grounds of appeal.

V. With its reply of 3 June 2014, the respondent (patentee) resubmitted the main request, on which the decision under appeal was based (see above point III), as well the requests labeled MRa, AR1 to AR5, and AR1a to AR5a, identical to those originally filed with letter dated 9 October 2013.

VI. With letters of 12 September 2014, 3 November 2014, and 13 May 2015, the appellants reiterated their arguments.

VII. With letter of 15 June 2015, the respondent submitted "a clean set of the requests submitted in October 2013", together with a consolidated list of documents filed during the appeal proceedings.

Claim 1 of auxiliary request AR1 differs from that as granted and of the main request (cf. above points I and III) in the inclusion of the term "monohydrate". Claim 1 of auxiliary request AR2 differs from that of AR1 in the incorporation of the further X-ray reflections listed in dependent claim 2 as granted. In claim 1 of auxiliary request AR3, the claimed subject-matter is further characterised by the X-ray powder diffraction (XRPD) diagram of dependent claim 3 as granted. Claim 1 of auxiliary request AR4 differs from that as granted in the inclusion of a product-by-

process feature based on granted claim 7; claim 1 of auxiliary request AR5 further includes the term "monohydrate". The requests suffixed with "a", that is, MRa and AR1a to AR5a, correspond to the main request and the auxiliary requests AR1 to AR5, respectively, with the expression "denominated Form QQ" added to claim 1.

VIII. Oral proceedings were held before the board on 17 and 18 June 2015.

Towards the end of the second day of oral proceedings, following the discussion on inventive step with respect to the main request, and the auxiliary requests filed with letter of 15 June 2015 (cf. above point VII), the respondent filed an additional auxiliary request AR6. This request differs from AR3 in the insertion at the end of claim 1 of the feature "wherein said crystalline form does not contain more than 5% of other crystalline forms".

IX. The appellants' arguments, insofar as they are relevant to the present decision, may be summarised as follows:

In relation to the question of entitlement to priority, the appellants argued that Article 87 EPC required a separate and express assignment of the right of priority executed by the applicants of the provisional US applications (P1) and (P2) and the respondent. It was recognised that a first filing created two distinguishable rights, namely, the right to the grant of a patent and the right of priority. The latter could be transferred independently of the former. Evidence to the effect that the respondent had acquired the right to the grant of a patent derived from the provisional applications (P1) and (P2) was therefore not sufficient

to prove that it had also acquired the rights of priority derived from the first filings. According to decision T 62/05, a transfer of a right of priority had to be proven in a formal way, that is, by way of an assignment declaration in writing signed on behalf of the parties to the transaction. The respondent had failed to provide evidence for such an assignment which met the required standard of proof. The contractual arrangements submitted by the respondent (documents (65b), (65c), and (65d)) only showed that obligations of the individual inventors and employees towards the employer existed. There was, however, no evidence that the inventors and employees had fulfilled their obligations to transfer their rights of priority derived from the US provisional applications (P1) and (P2) to the respondent. Moreover, it was not clear from the contractual arrangements which of the affiliates of the corporate group of the respondent was to be seen as the transferee. In addition, appellant opponent 5 argued that the respondent had not registered with the US Patent and Trademark Office as assignee of the US provisional applications (P1) and (P2). This was corroborating evidence that the respondent had not acquired the rights of priority derived from these applications.

As to the applicable law, the appellants concurred with decision T 62/05 which applied Article 72 EPC. It had been the aim of the legislator when drafting the EPC not to burden the EPO with questions of substantive national law. Moreover, the interpretation of contractual arrangements was at issue and not deficiencies as to formal requirements under national law. This had also been the case in cases T 1008/96 and T 62/05. The EPO was competent to assess the content of contracts.

With respect to the admission into the appeal proceedings of the decision dated 6 December 2012 of the Higher Regional Court of Düsseldorf (case I-2 U 46/12, printout, 24 pages), appellant opponents 2 and 3 argued that the content thereof was not a surprise to the respondent who had been a party to said proceedings. This decision was relevant with respect to the interpretation of Article 87 EPC.

The appellants raised a novelty objection with respect to the subject-matter of claims 1 to 3 of the main request, in view of document (2), either taken alone, or in combination with document (74). In this context it was submitted that the skilled person had no choice but to turn to example 7 of document (2), since it was the only example illustrating the more general disclosure with respect to salt formation. The adaptation thereof to the synthesis of ibandronate monosodium salt would inevitably lead the skilled person to the crystalline monohydrate form QQ falling within the scope of said claims, as demonstrated by the experimental evidence filed as documents (39), (52), (53) and (53a). The appellants disputed the contention of the respondent that the majority of experiments disclosed therein had failed to yield the claimed product. On the contrary, it had been demonstrated, under a variety of crystallisation conditions, that the XRPD diagram obtained matched that of claim 3 of the patent in suit. The fact that certain peaks fell outside the claimed error margin of "± 0.2 degrees 2θ" did not mean that a different crystalline form had been obtained. The skilled person would have been aware from document (5) that this rigorous standard was only to be applied under specific controlled conditions. Finally, the appellants argued that the respondent's counter-

experiments filed as document (73b) should be disregarded since they deviated in several respects from the instructions reported in example 7, such as in the degree of concentration of the reaction mixture, the means of addition, and the relative volume of antisolvent.

With respect to the allegation of lack of novelty based on the public prior use of the Bondronat 50 mg tablet, the appellants relied on their written submissions (see statements of grounds of appeal of appellants 2 and 3, respective points 3.4).

Turning to the issue of inventive step of the main request, the appellants referred to the decision of the opposition division in respect to the divisional patent, submitted as document (75), and argued that the analysis therein applied equally to the present case.

The Bondronat 50 mg tablet together with all available information on its components represented the closest prior art. For the sake of convenience, references in this respect were limited to document (30), since this contained the most relevant information, in particular, with respect to the drug substance ibandronate sodium monohydrate.

The appellants disputed the respondent's definition of the problem to be solved as lying in the provision of ibandronate sodium in a stable polymorphic form. In this context, the appellants firstly criticised the breadth of claim 1 as covering multiple crystalline forms. The XRPD data provided in the patent in suit confirmed that the five peaks defined did not uniquely characterise form QQ, but also other forms such as forms Q and Q2. From the respondent's data, filed

during the opposition proceedings with letter of 9 October 2013, it could be seen that the latter were not polymorphically stable. It must therefore be concluded that the alleged property was not exhibited over the whole scope claimed. The appellants further criticised that the evidence provided by the respondent in document (73c) was not suitable for demonstrating the polymorphic stability of form QQ, since important details relating to test conditions had not been specified, such as the temperature employed upon exposure to humidity. The problem to be solved could therefore merely be seen as lying in the provision of a crystalline form of ibandronate sodium. In the absence of any unexpected property, the solution proposed could not be regarded as involving an inventive step.

Moreover, even were it to be assumed that polymorphic stability had been demonstrated for the full scope claimed, the solution proposed would be obvious:

The drug substance disclosed in document (30), "ibandronic acid, monosodium salt, monohydrate", was described on page 13 as being "a very stable compound" and "a fine crystalline powder". Furthermore, according to this document, a second polymorphic form B had been identified; however, the manufacturing processes exclusively afforded polymorph A, and, even if form B was present, this would not affect the tablet performance. In view of this disclosure, it would have been clear to the skilled person that the relevant properties of the drug substance had been investigated according to standard procedures, as set out in Figure 1 of document (3), or in decision tree #4 of document (4), and that both polymorphs A and B, or at least the former, exhibited polymorphic stability under the conditions encountered during tableting and

storage. The distinction made by the respondent between polymorphic stability, on the one hand, and chemical and physical stability, on the other, was artificial and incorrect, as supported by numerous prior art documents, including documents (3) and (4).

Therefore, from the teaching of document (30), the skilled person would be aware of the existence of polymorphically stable forms of ibandronate monosodium monohydrate, and, in seeking to obtain such forms, would turn to document (2), since this described the synthesis of ibandronic acid, and procedures for the formation of the salts thereof. He would be reaffirmed in his expectation of success by document (74), and its disclosure of a scheme for the synthesis of ibandronate sodium monohydrate, together with a cross-reference to document (2). In applying the teaching of the latter to the synthesis of the former, the skilled person would recognise that Example 7 was the sole example relating to the formation of salts, and would adapt this example accordingly. In doing so, as evidenced by documents (39), (52), (53) and (53a), discussed in connection with novelty, the skilled person would directly obtain the crystalline form QQ of ibandronate sodium monohydrate, without the exercise of inventive skill. The method used was not inconsistent with document (30), as alleged by the respondent, since acetone was listed in the latter as one of the solvents employed in the manufacture of the drug substance. The alleged improvement in the reliability and consistency of the method of manufacture had not been demonstrated, and was irrelevant in assessing inventive step for the product claims under consideration.

An analogous analysis of inventive step also applied to the auxiliary requests. In particular, the introduction

of "monohydrate" in claim 1 of a number of these auxiliary requests could not impart an inventive step, since documents (30) and (74) already specifically disclosed this feature in the target drug substance. Moreover, the additional features introduced, such as the product-by-process feature in claims 1 of auxiliary requests AR4 to AR5a did not alter the substance of the subject-matter claimed.

Finally, the appellants maintained that auxiliary request AR6 should not be admitted into the proceedings. The feature introduced from the description gave rise to new objections of lack clarity and sufficiency at a very late stage of the proceedings. Moreover, specifying a degree of purity did not alter the fact that the subject-matter claimed related to form QQ of ibandronate sodium monohydrate as characterised by its XRPD diagram. Therefore, *prima facie*, this amendment could not overcome the deficiency of a lack of inventive step raised against higher-ranking requests.

X. The respondent's arguments, insofar as they are relevant to the present decision, may be summarised as follows:

In relation to the question of entitlement to priority, the respondent argued that, no matter whether Israeli or US law applied to the validity of the transfer, it had provided clear and convincing evidence, namely, in the form of documents (65b) to (65d), (66a), (66f), (66g), (67a), (67b), and (77), which showed that it was entitled, as an employer and successor in right to the three applicants of the US provisional applications (P1) and (P2), to the right of priority deriving from said applications. With respect to Israeli law, it was

established that the right of priority derived from the US provisional applications (P1) and (P2) had been acquired by operation of section 132 of the Israeli Patents Law 5727-1967, or by factual circumstances implying such a transfer, namely, through the fulfillment of contractual obligations, in the absence of a formal requirement for the transfer of the right of priority. There was no evidence on file that disproved the findings of the expert opinions that the respondent had provided. It was also clear from the decision of the German Federal Supreme Court filed as document (79) that Article 87 EPC did not require a formal and separate assignment as provided by Article 72 EPC for European patent applications. A transfer by conduct from the transferor to the transferee implying such a transfer under the circumstances was sufficient.

With respect to the question of choice of national law, the respondent argued that it had provided evidence for succession in title under both Israeli and US national law. In any case, it would be unreasonable and unpredictable to ask an applicant to comply with the law of each and every signatory state for which an application claiming priority of a first application was filed. It would be a reasonable solution to apply, in analogy to Article 60(1) EPC, the law of the country of employment in case of an employment relationship. In the alternative, also the application of the law of the state of the filing of the first application could be justified. The proprietor's evidence supported both choices.

The decision dated 6 December 2012 of the Higher Regional Court of Düsseldorf (case I-2 U 46/12, printout, 24 pages) could and should have been filed

before the oral proceedings. It was less relevant than the decision of 16 April 2013 of the German Federal Supreme Court (document (79)). The decision of the Higher Regional Court of Düsseldorf should therefore not be admitted into the proceedings.

With respect of the novelty objection based on document (2), the respondent submitted that there was no disclosure therein of ibandronic acid monosodium salt. The appellants had created an example for repetition that did not actually exist, based on numerous assumptions, as analysed in document (73a). Moreover, the data relied on by the appellants demonstrated that, in the majority of cases, a product exhibiting all five peaks listed in claim 1 of the main request had not been obtained. Finally, the respondent's own experiments, submitted as document (73b), provided further evidence that the claimed form QQ was not the inevitable result of a "repeat" of the prior art. Therefore, the novelty attack relying on the concept of "inevitable result" must fail. An analogous reasoning applied to the line of argumentation based on mosaicking documents (74) and (2).

On the subject the novelty objection based on the public prior use of the Bondronat 50 mg tablet, the appellants also referred to their written submissions (see reply dated 3 June 2014, items 68 to 88).

With respect to the issue of inventive step, the respondent defined the problem to be solved, starting from document (30) as the closest prior art, as lying in the provision of a polymorphically stable form of ibandronate sodium, that could be produced in a consistent and reliable manner. The solution proposed in claim 1 of the main request related to a crystalline

form of ibandronate sodium defined by the combination of five X-ray reflections that were characteristic of the form referred to in the patent in suit as form QQ. The data presented in document (73c) and in the letter dated 20 September 2013 demonstrated that this subject-matter successfully solved the problem posed.

The appellants' attack on the breadth of claim 1 was unfounded. Each of the forms disclosed in the patent in suit had been defined in terms of five unique peaks, followed by a more extended list. The respondent acknowledged that the five peaks defined in claim 1 may also be present in some of the more extended lists of peaks for other forms, but argued that they were not characteristic of the latter. Therefore, claim 1 of the main request did not relate to a multitude of forms, but defined the unique form QQ.

The solution claimed was not rendered obvious by any of the documents in the proceedings.

In this context, the respondent disputed the appellants' reading of document (30). Polymorphic stability related to the propensity to convert into an alternative crystalline or amorphous form under stress, storage or during processing. This was different from the stability referred to in section 7.1 of document (30), which clearly related to chemical and physical stability. The skilled person would have learned from the single paragraph of document (30) dealing with polymorphism that ibandronate sodium monohydrate existed in two polymorphic forms A and B, which had similar solubility and dissolution characteristics. The skilled person would therefore conclude that it did not matter whether either or both polymorphs were present in the tablet. It could not

even be excluded that the two forms might interconvert. The last sentence of said paragraph merely expressed a desired outcome, without any certainty that this would actually be achieved. Under circumstances, such as the present, where different polymorphic forms had been found not to influence the relevant performance characteristics, such as solubility and intrinsic dissolution properties, no further testing of the polymorphic stability would be necessary, as outlined in document (80), with reference to decision tree #4(2) of document (4). Therefore, no expectation could be derived from document (30) that forms A or B would exhibit stability towards polymorphic conversion. Furthermore, in document (30), the forms A and B were not characterised, nor was a complete synthesis provided. The only information with regard to the synthesis of the drug substance was to be found on page 12. Therein, it was disclosed that a seven-step process and the solvents "acetone, ethanol, methanol, diethylcarbonate, diisopropylether and methylethylketone" had been employed, and no catalysts. In seeking to produce the drug substance, the skilled person would not know which of the solvents listed or what conditions to use in the final crystallisation step. The required screening procedure represented a research project with unpredictable outcome with respect to achieving a polymorphically stable product. Therefore, document (30) alone could not render the claimed subject-matter obvious.

The remaining documents relied on by the appellants would also be of no assistance in this respect:

Document (74) related to the entry from 1999 for "ibandronate sodium monohydrate" from the handbook "Pharmaceutical Substances", and only constituted a

very general reference. It could be derived from the entry "Formulation(s)" that, at the time, Bondronat had only been authorised as an infusion concentrate. Therefore, the skilled person would have no reason to use document (74) as a source of information regarding the solid drug form. Moreover, the scheme depicting the synthesis of this substance did not include any specific conditions or solvents for the salt-formation step. The cross-reference to document (2) would also be of no help in this respect. In consulting the latter, the skilled person would have established that it only specifically disclosed a method for making ibandronic acid, but not salts thereof. The skilled person would therefore have concluded that said cross-reference was solely to the synthesis of ibandronic acid, and not the monosodium monohydrate thereof. Finally, the skilled person would recognise that the processes described in the relevant examples of document (2) were inconsistent with the information provided on page 12 of document (30), both in the use of catalysts and in the nature of the solvents employed. Consequently, the skilled person, starting from document (30), would not have relied on document (2) in seeking a solution to the problem posed.

Even were the skilled person to have considered document (2) with respect to suitable conditions for recrystallisation, the solvent systems generally suggested in the description of document (2), namely, water/methanol or water/acetone, although more limited than in document (30), still allowed for countless possible variations in the manner of performing the recrystallisation. As had been shown in the patent in suit, said solvent systems could be used to obtain numerous different polymorphic forms, many of which had been found to lack polymorphic stability.

With respect to the more specific disclosure of document (2), the respondent argued that the skilled person would certainly not have looked to Example 7, since this did not relate to the preparation of ibandronate sodium, but rather to a disodium salt of a structurally different diphosphonic acid. It was well known that even chemically related compounds frequently failed to crystallise under similar conditions. Consequently, the skilled person would not have considered adapting Example 7 in order to solve the problem posed, and the appellants' reliance on the data presented in documents (39), (52), (53) and (53a) was therefore not legitimate. Moreover, this data was deficient in several aspects, as had been analysed in detail during the discussion on novelty, with reference to document (73a). In particular, numerous assumptions had been made by the appellants in filling in the gaps in the disclosure of Example 7, with the aim of achieving the claimed subject-matter. This approach was based on hindsight. Furthermore, in the vast majority of cases the claimed polymorph had not been obtained. The respondent's own repetitions of Example 7 had also failed to yield this product.

Consequently, there was no avenue in the prior art leading the skilled person in an obvious manner to the claimed subject-matter as a solution to the problem posed, and certainly not in a consistent and reliable manner. Indeed, the in-house records of Roche, the marketing authorisation holder of document (30), which were on file in support of the allegation of prior use, indicated that difficulties had been encountered in consistently producing a single polymorph, and that mixtures of polymorphs were frequently obtained (see e.g. document (43), points 9 to 13). This would explain

why it had taken until February 2005 for the priority application of document (33) to be filed. Similarly, in Example 7 of document (2), insufficient guidance was provided to reliably obtain a single polymorph. For example, the ratio of the solvents acetone and water had not been specified, although this was critical in determining whether form T, form QQ or a mixture thereof would be obtained. An inventive step for the product claims could therefore be derived from the fact that the respondent had been the first to develop a reliable process for the production of a useful polymorphic form of ibandronate sodium.

This analysis applied all the more to the auxiliary requests, in which additional features had been introduced into claim 1 in order to more closely reflect the product obtained according to the processes disclosed in the patent in suit. A further argument in favour of inventive step for the auxiliary requests containing the feature "monohydrate" was to be seen in the fact that the skilled person could not predict whether a monohydrate would be obtained in processes according to document (2); it was noted that dihydrates had been obtained in Example 15.

Auxiliary request AR6, filed during oral proceedings before the board, should be admitted into the proceedings, since it merely represented an adaptation of AR3 previously on file, aimed at highlighting that a single polymorph was being claimed and providing a further contribution with respect to the closest prior art document (30), which provided an expectation that mixtures of polymorphs would be obtained.

XI. The appellants (opponent 2, 3, 5) requested that the decision under appeal be set aside and that the patent be revoked.

The respondent (patent proprietor) requested that the appeal be dismissed (main request) or, alternatively, that the decision under appeal be set aside and that the patent be maintained in amended form on the basis of main request MRa, or one of auxiliary requests AR1, AR1a, AR2, AR2a, AR3, AR3a, AR4, AR4a, AR5, and AR5a, all filed with letter dated 15 June 2015, or on the basis of the auxiliary request AR6 filed during the oral proceedings on 18 June 2015.

XII. At the end of the oral proceedings, the decision of the board was announced.

Reasons for the Decision

1. The appeals are admissible.

2. *Admission pursuant to Article 13(1) RPBA*

2.1 *Documents (77) and (80)*

During oral proceedings, the board decided to admit documents (77) and (80). Since appellant opponents 2 and 3 subsequently withdrew their request for non-admission of these documents, the reasons for this decision need not be discussed further.

2.2 *Decision dated 6 December 2012 of the Higher Regional Court of Düsseldorf in the case I-2 U 46/12*

2.2.1 The decision dated 6 December 2012 of the Higher Regional Court of Düsseldorf was submitted during the oral proceedings before the board, in the course of the discussion on entitlement to priority (see point 3 below). The admissibility of requests filed after a party has filed its statement setting out the grounds of appeal or the reply thereto and after a board has arranged oral proceedings is subject to Article 13(1) and (3) RPBA.

2.2.2 By virtue of Article 13(1) RPBA, a board's discretion in admitting any amendment to a party's case "shall be exercised in view of inter alia the complexity of the new subject-matter submitted, the current state of the proceedings and the need for procedural economy". Thus, the board has discretion to decide which of those criteria take precedence according to the circumstances of the case such that the importance of one of them may outweigh the others (see R 16/09, points 2.2.11 and 2.2.12 of the reasons). Pursuant to Article 13(3) RPBA, amendments shall not be admitted "if they raise issues which the Board or the other party or parties cannot reasonably be expected to deal with without adjournment of the oral proceedings".

2.2.3 In the circumstances of the present case, the lateness outweighs the other criteria for the exercise of discretion on admission of the late filed decision. No justification was given why the appellant opponents 2 and 3 submitted this decision only in the course of the oral proceedings after a first exchange of arguments on the issue of entitlement. Even if the appellant opponents' representatives had reassessed the

pertinence of this decision only shortly before the oral proceedings, they should have submitted it without delay and should not have waited until the oral proceedings thereby taking the respondent and the board by surprise. Irrespective of whether or not the respondent was familiar with this decision, the appellant opponents 2 and 3 could not have reasonably expected the respondent and the board, at such a late stage of the proceedings, to deal with this decision and the ensuing questions of relevance, especially with regard to the decision of 16 April 2013 of the German Federal Supreme Court (document (79)), without adjournment of the oral proceedings.

2.2.4 For the above reasons, the decision dated 6 December 2012 of the Higher Regional Court of Düsseldorf was not admitted into the proceedings.

2.3 *Auxiliary request AR6*

This request was filed at an advanced stage of the proceedings, on the second day, after the discussion on inventive step of the main request and numerous further requests had been completed. This very late filing of an additional auxiliary request incorporating a feature from the description runs counter to the principle of procedural economy. Moreover, the amendment introduced cannot be recognised as constituting an immediate reaction to an objection raised for the first time at oral proceedings, nor did the respondent argue that this was the case. Therefore, if considered necessary, the respondent could and should have filed this request in a more timely manner.

Consequently, the board decided not to admit auxiliary request AR6 into the appeal proceedings.

3. *Entitlement to priority*

3.1 The appellants contested the entitlement of the patent in suit to the priorities from US applications No. 60/604,026 of 23 August 2004 (P1) and 60/690,867 of 16 June 2005 (P2). They argued that the respondent had failed to prove to the required standard that, on the date of filing of the international application number PCT/US2005/030500, published as WO 2006/024024, the rights of priority derived from the US provisional applications (P1) and (P2), both filed in the name of the three inventors, had been validly transferred to the respondent. As a consequence, the date of filing of the international application WO 2006/024024 was the effective date for determination of the relevant state of the art, and document (33) had to be regarded as constituting state of the art within the meaning of Article 54(3) EPC and was thus novelty destroying.

3.2 The applicable provisions of the EPC 1973 and of the EPC in force as of 13 December 2007 are determined in accordance with the decision of the Administrative Council of 28 June 2001 on the transitional provisions under Article 7 of the Act revising the European Patent Convention of 29 November 2000 and with Article 2 of the Decision of the Administrative Council of 7 December 2006 amending the Implementing Regulations to the European Patent Convention 2000 (OJ EPO 2007, Special Edition No 1, 89, 197).

3.3 Pursuant to Article 87(1) EPC 1973, a right of priority, that is, the right to claim priority for a European patent application from the filing date of an eligible "first application" (or "previous application" in Article 88 EPC), originates in the applicant of said

first application. Therefore, in principle, the applicant has to be the same for the first application and for the subsequent application for which the right of priority is invoked. Where the first application has been filed jointly by two or more applicants, the right of priority belongs to them jointly (T 788/05, point 2 of the reasons).

However, pursuant to Article 87(1) EPC 1973, the right of priority may also be invoked by the "successor in title" of the person who has filed the first application. By reference to the "successor in title", it is recognised that the right of priority, being a legal right, may be transferred from the original applicant to a third person (T 62/05, point 3.6 of the reasons; see also T 5/05, point 4.2 of the reasons; T 788/05, point 2 of the reasons; T 382/07, point 9.1; T 1933/12, points 2.3 and 2.4 of the reasons; Grabinski, in: Benkard (Ed.), EPÜ, 2nd edition 2012, Art. 87 No. 3; Bremi, in: Singer/Stauder (Ed.), Europäisches Patentübereinkommen, 6th edition 2013, Art. 87 No. 53).

It is generally accepted that the right of priority is transferable independently of the corresponding first application which can remain with the original applicant. Furthermore, the right of priority may be transferred to a third person for one or more countries only (T 62/05, point 3.6 of the reasons; see also Grabinski, in: Benkard (Ed.), EPÜ, 2nd edition 2012, Art. 87 No. 3; Bremi, in: Singer/Stauder (Ed.), Europäisches Patentübereinkommen, 6th edition 2013, Art. 87 No. 53). It is thus an independent right up and until it is invoked for one or more later applications to which it becomes an accessory. The right of priority has thus to be distinguished from the right to the

patent deriving either from substantive law or from the status of being the applicant of the first application.

The board does not share the appellants' view that the characterisation of the right of priority as a right independent of the right to the priority application implies that the valid transfer of a priority right inevitably requires a separate and express assignment declaration. The requirements for a valid transfer of rights of priority is a matter distinct from the characterisation as an independent legal right. Article 87 EPC 1973 is silent on the requirements for a valid transfer of rights of priority. It neither requires an express assignment in writing nor excludes a transfer by operation of law or by conduct of the parties concerned implying such transfer. This issue will be addressed in more detail below (see point 3.6).

3.4 The reference to the "successor in title" in Article 87(1) EPC 1973 is also interpreted as requiring a transfer of the right of priority before the filing of the subsequent application (implicit in T 493/06, point 11 of the reasons; Grabinski, in: Benkard (Ed.), EPÜ, 2nd edition 2012, Art. 87 No. 4; Bremi, in: Singer/Stauder (Ed.), Europäisches Patentübereinkommen, 6th edition 2013, Art. 87 No. 53 and 54; Ruhl, Unionspriorität, 2000, p. 100 No. 262; Teschemacher, Anmeldetag und Priorität im europäischen Patentrecht, GRUR 1983, 695, p. 699; see at national level: document (79), point 11 of the reasons; Patents Court, decision of 12 June 2009, Edwards Lifesciences AG v Cook Biotech Incorporated [2009] EWHC 1304 (Pat), point 95 of the reasons; Patents Court, decision of 23 June 2010, KCI Licensing Inc & Ors v Smith & Nephew Plc & Ors [2010] EWHC 1487 (Pat), point 54 of the reasons; see also Wieczorek, Die Unionspriorität im Patentrecht, 1975, p.

142). The board is aware of diverging opinions (see Moufang, in: Schulte (Ed.), Patentgesetz mit Europäischem Patentübereinkommen, 9th edition 2014, §41 No. 28; German Federal Patent Court, decision of 28 October 2010, 11 W(pat) 14/09, BlPMZ 2011, 255, point B.2)a)cc) of the reasons). This divergence is, however, not relevant for the outcome of the present decision (see below point 3.7).

3.5 If entitlement to priority is challenged, a successor in title, who desires to take advantage of the priority of a first application and who asserts that priority is rightly claimed from the first application, has to prove its entitlement to that right, which includes a valid transfer of the right of priority (T 1008/96, point 3.3 of the reasons; T 493/06, point 8 of the reasons). In the present case, the burden of proof is therefore on the respondent to establish that

a) before the date of filing of the international application WO 2006/024024 (see the proviso in point 3.4 above)
b) the right of priority derived from the US provisional applications (P1) and (P2) had been transferred to it
c) by the three original applicants and inventors
d) in accordance with the requirements of the relevant law.

3.6 Before assessing the evidence on file, the relevant law that governs the requirements for a valid transfer of the right of priority for the filing of a European patent application under Article 87(1) EPC 1973 has to be determined. Neither Articles 87 EPC 1973 and 88 EPC, nor Rules 52 and 53 EPC set out any such requirement.

3.6.1 Decision **T 62/05** (points 3.8 and 3.9 of the reasons) considered that the transfer of right of priority had to be be proven in a formal way and that it was therefore appropriate to apply an equally high standard of proof as required by Article 72 EPC 1973.

The present board cannot follow this reasoning, which was relied upon by the appellants.

The standard of proof defines the degree of persuasion that is required in order to convince the deciding body of the existence of an alleged fact. The standard applied by the boards of appeal is "balance of probabilities" which amounts, in practice, to proof on preponderant balance of evidence. The seriousness of the consequences of alleged facts should not make any difference to the standard of proof to be applied in determining these facts. Article 72 EPC 1973 does not concern the issue of standard of proof, but sets out formal requirements for a valid assignment of a European patent application and thereby limits the means of giving or obtaining evidence for the determination of such a transfer. Relying on Article 72 EPC 1973 would thus establish an exclusionary rule of evidence, in that it excludes all evidence which is not in the form as required by Rule 20 EPC 1973. Having regard to Article 117 EPC and the principle of free evaluation of evidence, such an exclusionary rule of evidence should not be extended beyond its scope of application.

Article 72 EPC 1973 constitutes harmonised law with respect to the formal requirements for a transfer of a validly filed European patent application and overrules as *lex specialis* national law which, in general, governs legal acts related to property interests in

such applications (Article 74 EPC 1973). No reason is apparent for applying Article 72 EPC 1973 by analogy in the context of a transfer of right of priority preceding a subsequent filing:

As regards its material scope, Article 72 EPC 1973 is concerned with the transfer of a European patent application and the associated rights, foremost the right to the grant of a patent to which the applicant is assumed to be entitled (Article 60(3) EPC 1973). The right of priority derived from a first application only becomes an accessory to subsequent applications for which it was rightfully invoked. Until then, the right of priority is a distinguishable right that is transferable independently of the corresponding first application. Thus, applying Article 72 EPC 1973 to the transfer of a right of priority in view of a subsequent European patent application would, in the case of a European first filing, ignore the fact that the priority right is a right independent of the right to the first application and, in the case of a non-European first filing, that Article 72 EPC 1973 does not govern the relationship between the applicant of a European patent application and a different applicant of a distinct first application. Indeed, the provisions concerning a transfer of rights, namely Article 72 EPC 1973 in conjunction with Rule 20 EPC 1973, and the related provisions (Articles 60(3) EPC 1973 and 61 EPC) serve another purpose. They define the conditions under which the EPO may take into account questions of substantive law and procedural acts by a person **other than the registered applicant** (J 2/01, OJ EPO 2005, 88, point 3 of the reasons).

Neither the systematic context (Articles 61 EPC, and 60(3), 72, and 74 EPC 1973), nor the preparatory work

to Article 72 EPC 1973, which is silent with respect to the question of transfer of the right of priority, leave room for applying Article 72 EPC 1973 in a way which goes beyond its clear wording. The board therefore concurs with the decision of 16 April 2013 of the German Federal Supreme Court (filed as document (79), point 13 of the reasons) that Article 87 EPC does not require a formal and separate assignment as provided by Article 72 EPC.

3.6.2 The board further considered the question whether the silence of the EPC with respect to the requirements for a valid transfer of a right of priority implies that there are no formal requirements for such a transfer under the EPC. It would thus be possible to establish a transfer of a right of priority using any kind of evidence within the meaning of Article 117 EPC. It would be sufficient to demonstrate such a transfer by way of conduct of parties to a contract implying the transfer in the circumstances of the case. However, this would exclude the possibility of a transfer by operation of law which can only be established by reference to a (comprehensive) legal system. Also, the board's assessment of the evidence adduced will inevitably need to be made by reference to defined formal and material requirements. As an example, the question whether it is sufficient to have a declaration by the transferor only or whether an employee may transfer all its future rights in an invention to an employer cannot be resolved under the EPC. It has to be born in mind that the EPC does not establish a fully harmonised patent system, although a high degree of harmonisation between the EPC and national laws has indeed been achieved. Neither the interpretation of the EPC nor the application of Article 125 EPC, which refers to procedural law only, constitute a proper

basis for further harmonisation to the extent that the EPC does not clearly provide for harmonised law itself. For these reasons, the board did not take silence as a conscious choice of the legislator that the transfer of a right of priority is free of requirements as to form and content.

3.6.3 Since the provisions of the EPC do not lend themselves to an autonomous determination of the requirements for the transfer of right of priority, the validity of such transfer is a **matter of national law**. The board concurs in this respect with decision T 1008/96, point 3.3 of the reasons. The board also notes that other decisions have relied on national law when assessing the validity of a transfer of the right of priority (see T 160/13, point 1.1 of the reasons; J 19/87, point 2 of the reasons; implicit in T 493/06, points 9 to 11 of the reasons).

The appellants argued that it had been the intention of the legislator not to burden the EPO with questions of substantive national law. While it is true that it was held with respect to the purpose of Article 60(1) and (3) EPC 1973 that the EPO should not be concerned with questions of entitlement in terms of substantive law and should have no power to determine disputes as to whether or not a particular applicant is legally entitled to apply for and be granted a European patent in respect of the subject-matter of a particular application (J 2/01, OJ EPO 2005, 88, point 2.6 of the reasons, citing G 3/92, OJ EPO 1994, 607, point 3 of the reasons), this reasoning cannot be extended beyond the context of Article 60(1) and (3) EPC 1973. The EPC does not, as a matter of principle, bar the organs of the EPO from applying substantive national law governing an incidental question which is decisive for

the outcome of the proceedings before the EPO (see for example G 3/99, OJ EPO 2002, 347, point 9 of the reasons; G 1/13, points 2.3.3, 5.1, 6 to 8 of the reasons). In the board's judgment, the assessment of whether the applicant of a European patent application is "successor in title" within the meaning of Article 87(1) EPC 1973 of the right of priority deriving from an earlier application is the exclusive concern of national law.

The above cases did, however, not address the issue of the choice of the applicable national law. Indeed, the determination of the applicable national law seems to have been straightforward in view of the circumstances of the respective cases:

- In case J 19/87, the inventor, resident of the UK, filed a UK patent application. He then assigned his rights to the invention and to the UK patent application, together with the right to file further patent applications in respect of the invention and the right to claim priority from the UK application to a company with place of business in the UK. This company, in turn, assigned back the rights in the invention and the UK application and agreed that the first assignment was void. The inventor then filed a European patent application claiming priority from the UK patent application. All circumstances relevant to the transfer of right of priority (residence, place of business, state of of the first filing, assignment contracts) thus related to UK law, and the board was safe in applying this national law to the question of entitlement to the priority.

- In case T 1008/96, the European patent application resulting in the patent in suit claimed the priorities of two Italian utility model applications. The patent proprietor, a company with place of business in Italy, alleged that the applicant of the two Italian utility model applications, an Italian resident, had assigned these applications to it. One of the opponents produced an Italian Court decision according to which the transferor was still the owner of the first of the two priority applications after the date of the alleged assignment. Again, all circumstances relevant to the transfer of right of priority (residence, place of business, state of first filing, assignment contracts) were connected with Italy and thus with Italian law. The legal situation under Italian law appears not to have been backed up by detailed evidence and the decision was taken based on the evaluation of the conflicting evidence on file.

- In case T 493/06, the entitlement to priority of an international patent application which constituted state of the art within the meaning of Articles 54(3) and (4) EPC 1973 was contested. This application to which one of the opponents was co-applicant claimed priority of five UK patent applications. Two of these were filed in the name of a professional representative, having its place of business and residence in the UK, who had acted as trustee. An assignment document was produced relating to the transfer from the trustee to the opponent, a company with place of business in the UK. Also in this case, the factual circumstances were connected to the UK, implying the application of UK national law.

- Finally, case T 160/13 concerned the transfer within a corporate group. The patent in suit was filed as an international application by an affiliate with place of business in France and claimed the priority of a German utility model application, which had been filed by an affiliate with place of business in Germany. Here, the place of business of the transferor, the state of filing of the first application and the assignment declaration by the transferor (e-mails sent by an employee of the German affiliate) were factual elements connected to German territory. Only the place of business of the transferee tended to the application of a law other than German law. Unfortunately, in this case, neither the opposition division nor the board justified their explicit choice of German law.

3.6.4 In none of the above decisions was the law of the state for which protection was sought **by the subsequent filing** considered to be relevant. Indeed, in the case of a subsequent European patent application this would require harmonised law. The above decisions, however, provide no guidance as to whether, in the assessment of the validity of a transfer of the right of priority, the law applicable to the **legal relationship between the transferor and the transferee** of the right of priority, such as corporate agreement, employment contract, or universal succession, should apply, or the law of the **state of filing of the first application**. Whereas this point of law was not at issue in the cases referred to above, it is relevant to the present decision: The applicants of the US provisional applications (P1) and (P2) were employees of the respondent working in Israel. Thus, whereas the first

filings point to US law, the employment relationship is connected to Israel.

3.6.5 Articles 87 EPC 1973 and 88 EPC and Rules 52 to 53 EPC are silent on the choice of law to be made with respect to the assessment of the validity of a transfer of rights of priority. Nevertheless, in the absence of harmonised law, the board must determine the applicable national law, since this is essential for reaching a decision as to whether said transfer has been properly established and proven by the party bearing the burden of proof in this respect.

In the board's judgment, the following considerations militate in favour of the law applicable to the legal relationship between the transferor and the transferee of the right of priority, and against the law of the state of filing of the first application:

- In view of the potential legal implications of the date of (first) priority in the assessment of patentability or validity of a patent application or patent, it is imperative that applicants and the public at large be provided with legal certainty and predictability with respect to the rules of law governing the subject of claiming priority, including the assessment of validity of a transfer of the right of priority.

  Many factors may be envisaged that might influence the choice of state for the filing of a first application. A first applicant intending to transfer its priority right might not therefore anticipate that the law of the state of filing of the first application might govern its relationship with a transferee and that they might

have to comply with this law even when there is no connection between the state of first filing and their legal relationship.

On the other hand, the transferor and transferee of the right to priority will be familiar with the law that governs their legal relationship and thus be aware of any formal requirements regarding the transfer of the right of priority. The application of this law will not hamper legal certainty, since, in the event that the entitlement to the priority becomes relevant, the applicable law can be ascertained and verified on the basis of the evidence that the applicant or proprietor will have to provide.

- The law of the state of filing of the first application is relevant for the determination of a regular first application (Article 87(2) EPC 1973). The fate of such first application does not, however, prejudice the right of priority claimed for a subsequent application (Article 87(3) EPC 1973). Moreover, the transferability of the right of priority as such is determined by Article 87(1) EPC 1973, independently of the law of the state of filing of the first application. Therefore, there is no connection between this law and the question of a valid transfer.

- Finally, the board also notes that Article 60(1), second sentence, EPC 1973 provides a conflict-of-law rule for the determination of the entitlement to the invention in an employment relationship. According to this provision, the law of the state in which the employee is mainly employed is applicable, or, alternatively, the law of the

state in which the employer has its place of business to which the employee is attached. Albeit not applicable to the right to priority, this conflict-of-law rule reflects the understanding of the legislator that mutual obligations of employer and employee in relation to the transfer of an intellectual property right arising from the employee's efforts shall be governed by the law of the state to which the employment relationship is most closely connected. Moreover, this choice of law follows on from Article 60(1), first sentence, EPC 1973, which uses the term "successor in title" without defining it and thereby leaving its determination to national law.

3.6.6 For the above reasons, the board concludes that, in the present case, the law of the state of the employment relationship between the three original applicants and the respondent determines the transfer of the right of priority. At the time of filing of the international application WO 2006/024024, the original applicants were employees of the respondent (see point 3.7.1 below). Both the state where the original applicants were employed and the place of business of the respondent, to which the original applicants were attached, are Israel. Therefore, Israeli law applies.

3.7 Turning to the evidence before it, the board had to evaluate whether it provided proof that

a) before the date of filing of the international application WO 2006/024024

b) the right of priority derived from the US provisional applications (P1) and (P2) had been transferred to the respondent

c) by the three original applicants and inventors

d) in accordance with the requirements of Israeli law.

3.7.1 Documents (65b), (65c), and (65d) provide conclusive evidence that the three inventors and applicants of the US provisional applications (P1) and (P2), Ms Revital Lifshitz, Mr Thomas Bayer and Ms Judith Aronhime, were employees of the respondent. These documents also show that the employment relationship existed at the time when the invention can be presumed to have been made, namely, before the filing of the US provisional applications (P1) and (P2). Even though the letter setting out the conditions of employment of Ms Judith Aronhime (document (65d)) has a date which is after the filing date of the US provisional application (P1), reference is made in said letter to her appointment as of 1 August 2004. Furthermore, the first confidentiality agreement between the respondent and Ms Judith Aronhime was signed on 24 April 1994. This shows that Ms Judith Aronhime was an employee of the respondent even before her appointment to her position as of 1 August 2004.

3.7.2 The invention giving rise to the US provisional applications (P1) and (P2), as well as to the international application WO 2006/024024, qualifies as a service invention under Chapter 8 of the Israeli Patents Law 5727-1967, which is applicable in the present case (reference is made herein to the English translations filed as documents (66f) and (66g)). The first expert opinion of Mr Tal Band of 21 May 2012 (document (66a), point 7 of the opinion) provides proof for this factual and legal aspect. Mr Tal Band confirmed his assessment in a second opinion dated 1 June 2014 (Exhibit 2 to document (77), point 7 of the

opinion). The board sees no reason to doubt the conclusion reached in these opinions.

3.7.3 The respondent argued that it had acquired the right of priority derived from the US provisional applications (P1) and (P2) by operation of section 132 of the Israeli Patents Law 5727-1967. In support of its contention, the respondent relied on the opinions of its expert, Mr Tal Band (documents (66a) and (77), Exhibit 2).

Section 132 of the Patents Law 5727-1967 reads as follows:

"Inventions in consequence of service

(a) An invention by an employee, arrived at in consequence of his service and during the period of his service (hereafter: service invention) shall, in the absence of an agreement to the contrary between him and his employer, become the employer's property, unless the employer relinquishes the invention within six months after the day on which notification under section 131 was delivered to him.

(b) If, in his notification under section 131, the employee stated that – in the absence of a contrary reply from the employer within six months after delivery of the employee's notification – the invention will become the employee's property, and if the employer made no contrary aforesaid reply, then the invention shall not become the employer's property."

In both, his first and second opinion, Mr Tal Band provided the following opinion on the legal effects of

section 132 of the Israeli Patents Law 5727-1967 (documents (66a) and (77), Exhibit 2, points 8 to 10):

"8. Once an invention is deemed to be a service invention, and in the absence of any agreement to the contrary between the employer and the employee, Section 132 of the Patents Law provides that the invention shall become the property of the employer. Israeli law does not require any written instrument of assignment in such circumstances to transfer the ownership rights in the service invention from the employee (or employees) to the employer. The full ownership of a service invention inherently vests in the employer by virtue of the law, once the invention is arrived at by the employee.

9. The employer's ownership of a service invention would inherently entail, under Israeli law, the right to file a patent application on the invention. The employer's ownership of a service invention further entails the right to claim priority from an application filed on the invention abroad (i.e. in any country which is "a Member State", as defined in Section 1 of the Patents Law), by the employees, for and on behalf of the employer. Accordingly, it is my opinion that, under Israeli law, the right to claim priority from such an application inherently vests in the employer, without any need for a written instrument of assignment of the specific right of priority from the employees to the employer.

10. I was advised by Teva, and accordingly it is my factual assumption for the purpose of this expert opinion in connection with the ending passage of Section 132(a) above, that Teva never renounced the invention. It is also my understanding, and accordingly

my factual assumption for the purpose of this expert opinion, that none of the three inventors in the present case gave Teva a notification that would render Section 132(b) applicable."

3.7.4 The board has no reason to doubt the above conclusions by the respondent's expert. It is true that an opinion by an expert who has represented a party "in numerous proceedings" (see documents (66a) last sentence of the second paragraph, and document (77), Exhibit 2, last sentence of the second paragraph) may, upon free evaluation of the evidence, carry less weight than a court decision, another independent authority under the national law, or an expert commissioned by the board under Article 117(1)(e) EPC together with Rule 117, first sentence, EPC. Nevertheless, an opinion of a party's expert is a means of evidence under Article 117(1) EPC. In the present case, the appellants did not file any contrary evidence. Of course, both the legal and evidentiary burden of proof rested on the respondent to establish its right to claim priority from the US provisional applications (P1) and (P2). The appellants could therefore limit themselves to casting doubt on the credibility of the evidence adduced by the respondent. However, in doing so, they ran risk that, in the absence of further evidence disproving the conclusions in the respondent's expert opinions, the board could decide in favour of the respondent, if the appellants' challenge to the evidence before the board did not give rise to substantiated doubts as to the veracity of these expert opinions.

3.7.5 The board cannot make out any flaws in the opinions of Mr Tal Band.

The finding that, under Israeli law, the full ownership of a service invention belongs to the employer, by virtue of the law and without any need for a written instrument of assignment, is confirmed by the wording of section 132 of the Patents Law 5727-1967. Since the invention that gave rise to the US provisional applications (P1) and (P2) qualified as a service invention within the meaning of section 132 of the Patents Law 5727-1967 (see point 3.7.3 above), the right to the invention passed to the respondent under said provision. Moreover, the factual assumptions in the opinions that the respondent had not relinquished the invention giving rise to the US provisional applications (P1) and (P2), and that the invention had not remained with one of the inventors under section 132(b) of the Patents Law 5727-1967, have never been contested by the appellants.

The second step in the chain of argument, namely, that the employer's ownership of a service invention further entails the right to claim priority from an application filed by the employees for and on behalf of the employer, was also not reasonably put into doubt. It is true that the right of priority is not mentioned in section 132 of the Patents Law 5727-1967. However, it follows from section 140 of the Patents Law 5727-1967 that the aim of section 132 is to vest the employer with the rights to obtain worldwide protection for service inventions made by his employees. The appellants did not invoke any other provision or legal authority which would support the view that the right of priority was excluded from the operation of section 132 of the Patents Law 5727-1967 and which would have put into question the expert's conclusion that the employer's ownership of a service invention

further entails the right to claim priority from an application filed on the invention abroad.

The appellants argued that section 140 of the Patents Law 5727-1967 merely created an obligation of the employee to act in the interest of the employer and therefore required with respect to the transfer of the right of priority an express written assignment executed by the employee. The board does not agree.

Section 140 of the Patents Law 5727-1967 reads as follows:

"If a person made a service invention and if the ownership of it passed, in whole or in part, to his employer under section 132 or by agreement, then he must do everything required of him by the employer in order to obtain protection for the invention to the employer's benefit in any place whatsoever, and he must sign any document required therefor; if he does not do so, then the Registrar may permit the employer to do so after he has given the employee an opportunity to state his arguments."

It follows from the wording of this provision that the employee's obligation to sign a document is only stated with respect to a corresponding requirement in the law of the state of the filing of a patent application. It cannot be read into section 140 of the Patents Law 5727-1967 that a valid transfer of the right of priority requires a declaration of assignment executed by the inventor. Apart from the fact that section 140 does not make any reference to the right to priority, such an interpretation would create an additional hurdle for the employer in obtaining patent protection for service inventions and thus run counter to the aim

of this provision. Since the Patents Law 5727-1967 does not provide elsewhere for formal requirements for the transfer of the right of priority, the transfer of the right of priority arising from a first filing by an employee-inventor does not, under Israeli law, require any written document signed by the employee in accordance with section 140 either. It is therefore reasonable to conclude from sections 132 and 140, with respect to a service invention, that the right of priority arising from a first filing by an employee-inventor - albeit being a right separate of the right to the invention - will devolve to the employer as a necessary correlate of the employer's entitlement to seek worldwide protection for the invention.

3.7.6 For the above reasons, the board was satisfied that the respondent had discharged its burden of proof and provided convincing evidence for the fact that the right of priority derived from the US provisional applications (P1) and (P2) had been transferred to the respondent before the date of filing of the international application WO 2006/024024.

3.8 The board was not persuaded by the appellants' counter-arguments:

3.8.1 The appellants brought forward the argument that, with respect to a transfer of the right of priority, a distinction had to be made between the obligation to assign the rights and the separate act of assignment. They maintained that the contractual arrangements in documents (65b), (65c) and (65d) merely created obligations. Such obligations could not be regarded as proof for a subsequent valid transfer of rights. With respect to the right of priority, the fulfillment of the contractual obligations of the inventors and

original applicants therefore required a separate assignment. According to the appellants, the respondent had failed to provide proof for such assignment.

It is true that, with respect to Rule 20 EPC 1973, a distinction is made in the jurisprudence of the boards of appeal between an obligation to assign a right and the assignment itself (J 4/10, point 5.4 of the reasons; J 12/00, points 2 and 14 of the reasons). This jurisprudence pertains, however, to Article 72 EPC 1973, which is not applicable in the present case. Such a distinction has no bearing on the transfer of a right of priority if, according to the applicable national law, the right is transferred by operation of law (e.g. merger or succession), or if an assignment does not require specific formalities and thus can be implied from the circumstances. This is, for example, the case under German and Swiss national law (T 160/13, point 1.1 of the reasons; document (79), points 12 and 14 of the reasons; Bremi, epi Information 1/2010, page 18, left-hand column, second complete paragraph).

In the present case, the applicable Israeli law on service inventions does not require particular formal requirements to be fulfilled; in particular, it does not require a separate and express assignment. Even if, for the sake of argument, section 132 of the Patents Law 5727-1967 regarding service inventions were to be disregarded, a transfer of the right of priority can nevertheless, in the absence of formal requirements under Israeli law, be agreed orally between the employee and the employer, or even be manifested by way of circumstances implying such transfer. Thus, even when considering the contractual arrangements (documents (65b), (65c) and (65d)), in particular the agreement that no proprietary or other right to a

service invention remained with the employees, and the obligations under section 140 of the Patents Law 5727-1967 only, the circumstances were such that the filing of the international application WO 2006/024024 claiming priority from the US provisional applications (P1) and (P2) in the name of the respondent (except for the United States of America and Barbados) would, in the board's judgement, imply a mutual agreement between the inventors and the respondent on the transfer of the right of priority to the latter.

3.8.2 The appellants also pointed to differences in the extent of the respective contractual obligations of the three inventors and employees (documents (65b), (65c) and (65d)). It is true that the degree of detail on which the rights and duties are stated varies among the respective arrangements. However, even the less detailed contractual agreements (that is, the confidentiality agreement dated 16 August 1998 and signed by Ms Revital Lifshitz, document (65b), and the first confidentiality agreement dated 24 April 1994 and signed by Ms Judith Aronhime, document (65d)) state that **all** rights in a invention arrived at by the employee in the course of or in connection with the employment, exclusively belong to the employer without **any** proprietary or other right remaining with the employee. Thus, all contracts confirm and reflect what is set forth in section 132 of the Patents Law 5727-1967. The further obligation to sign any document as required by the employer in order to obtain patent protection is not to be found in the confidentiality agreements referred to above. However, such obligation existed already under section 140 of the Patents Law 5727-1967. Therefore, the contractual arrangements neither contradict nor do they depart from the regulation on service inventions enshrined in Chapter 8

of the Patents Law 5727-1967. Since the respondent provided conclusive evidence, which was not countered by any evidence filed by the appellants, that the right of priority derived from the US provisional applications (P1) and (P2) had been transferred to the respondent before the date of filing of the international application WO 2006/024024 by operation of section 132 of the Patents Law 5727-1967, the alleged differences in the contractual arrangements are not relevant for the present decision and would in any case not lead to a different conclusion.

3.8.3 According to the appellants, it was not clear from the confidentiality agreements (that is, in the case of Ms Revital Lifshitz, the confidentiality agreement dated 16 August 1998 included in document (65b); in the case of Mr Thomas Bayer, the undated Appendix B entitled "Safeguarding Trade Secrets, protection of intellectual Property and Non Compete Agreements" included in document (65c); and in the case of Ms Judith Aronhime, a first confidentiality agreement dated 24 April 1994 and Appendix B dated 19 December 2004 entitled "Letter of undertaking to maintain confidentiality, intellectual property and non-competition", both included in document (65d)) who the potential transferee of a right of priority was. The relevant passages referred to "the Company and/ or ... the Subsidiary Companies" or to "Teva Group" or "Teva" which were, in a nutshell, defined as any corporation controlled by Teva Pharmaceutical Industries Ltd. or Teva, respectively. The board, however, agrees with the opposition division that there is no doubt that the employment agreements were concluded between the respondent and the respective inventors and applicants of the US provisional applications (P1) and (P2). Therefore, the respondent

was employer within the meaning of Chapter 8 of the Patents Law 5727-1967. Whether the respondent could have transferred its rights to affiliated companies is relevant only with respect to the designation of Barbados, but not for the case under consideration.

3.8.4 The appellants also pointed to an incoherence in dates as regards the opinion of Mr Tal Band signed on 21 May 2012 (document (66a)) and the reference to an opinion of Mr Tal Band in the earlier opinions of Mr Patrick J. Birde dated 15 February 2012 (document (67a)) and of Mr Robert C. Millonig and Ms Gaby L. Longsworth dated 23 April 2012 (document (67b)). Moreover, document (67a) refers to an "Expert Opinion of Adv. Tal Band, dated 14 February 2012". The respondent provided a letter dated 2 June 2014 (document (77)) of Mr Patrick J. Birde wherein he states that a review of three versions of the opinion of Mr Tal Band dated 14 February 2012, 21 May 2012 and 1 June 2014, respectively, revealed small differences. The existence of different versions of an expert opinion is as such not sufficient to cast the opinion into doubt. What matters is whether or not the versions are contradictory or incoherent. In the present case Mr Tal Band confirmed and reiterated his opinion dated 21 May 2012 (document (66a)) on 1 June 2014 (document (77), Exhibit 2). There are no deviations that could give rise to substantiated doubts.

3.8.5 Appellant opponent 5 argued that the respondent had not registered as assignee of the US provisional applications (P1) and (P2). In the opinion of appellant opponent 5 this created doubt as to the respondent's entitlement to claim priority from these applications. However, since the fate of a first application does not prejudice the right of priority claimed for a

subsequent application and because the right of priority can be transferred independently of the right to the first application, the question of entitlement to the US provisional applications (P1) and (P2) is not relevant. Even though registration of the respondent as assignee of the US provisional applications (P1) and (P2) might have provided corroborating evidence for an implied transfer of the right of priority, such evidence was not required in the present case.

3.9 Consequently, the board holds that the international application WO 2006/024024 enjoys the earliest priority date of 23 August 2004.

4. *Novelty (Articles 52(1), 54 EPC), main request*

Since the question of novelty turned out not to be decisive for the outcome of the present appeal (see point 5 below), the reasoning of the board in acknowledging novelty for the subject-matter of the main request is only briefly discussed:

4.1 *Document (33)*

The appellants did not raise any issue with respect to the disclosure of the priority application (P1). Therefore, in view of the conclusion on entitlement to priority, as detailed above in point 3, document (33) is not regarded as constituting state of the art within the meaning of Article 54(3) EPC, since the subject-matter claimed enjoys the earlier effective date of (P1).

4.2 *Document (2)*

As set out below in point 5.5.5, ibandronic acid is specifically disclosed in document (2). With respect to salt formation, there is a general description of the transformation of the diphosphonic acids into their mono- or dialkali metal salts, for example with sodium or potassium hydrogen carbonates or aqueous solutions of sodium or potassium hydroxide. Therefore, a choice is given with respect to the number and type of alkali metal counterions, without a direct and unambiguous singling out of ibandronic acid in the form of its monosodium salt. For this reason alone, novelty of the subject-matter of claim 1 of the main request with respect to document (2) must be acknowledged.

4.3 *Combination of documents (74) and (2)*

In document (74), a scheme is disclosed for the synthesis of ibandronate sodium monohydrate, together with a reference to document (2) (see point 5.5.4 below). According to said scheme, the reagent used for salt formation is sodium hydroxide (see scheme arrow, "2. NaOH"). However, in document (2), this reagent is not only disclosed in example 7, but also in the relevant general part of the description (cf. passages reproduced below in point 5.5.5). Therefore, contrary to the contention of the appellants, document (2) offers a range of conditions that may be used in the isolation of the diphosphonic acid salts, in particular, "reprecipitation from water/methanol or from water/acetone". Moreover, as can be seen from the patent in suit (see examples, and also Table 2), a number of different crystalline forms of ibandronate sodium can be obtained with these solvent systems. Therefore, it is concluded that form QQ is not the inevitable result of the combined disclosures of documents (74) and (2).

4.4 *Public prior use*

The case presented in writing with respect to the lack of novelty based on the public prior use of the Bondronat 50 mg tablet already fails with regard to the issue of the analysability of said tablet (see decision of Enlarged Board of Appeal G 1/92, OJ EPO 1993, 277, headnote). In particular, the evidence on file does not allow the conclusion that the skilled person would have all the necessary information at his disposal in order to be able to formulate the required placebo tablet, and then, from a comparison of its XRPD pattern with that of the commercially available material, that he would have been able to identify a polymorph in the latter having all five characteristic peaks listed in claim 1 (cf. decision under appeal, pages 26 to 28, points b and c).

5. *Inventive step (Articles 52(1), 56 EPC), main request*

5.1 Claim 1 relates to a crystalline form of ibandronate sodium characterised by five XRPD reflections; in dependent claim 2, five further peaks are defined; and, in dependent claim 3, the full diffractogram is depicted (see above point I).

With respect to the construction of claim 1, the appellants argued that a multitude of crystalline forms were embraced. The analysis below is based on the narrower reading of claim 1 put forward by the respondent, namely, that the five peaks specified characterised the unique crystalline form designated "form QQ" in the patent in suit, as defined in more detail in dependent claims 2 and 3. In view of the conclusion of lack of inventive step based on this

narrower reading, as set out below, it was not necessary to address the appellants' line of attack based on the breadth of claim 1.

5.2 The board considers, in agreement with the parties, that document (30) represents the closest state of the art. Document (30) is the EPAR Scientific Discussion document for Bondronat, in the version published after approval of the 50 mg film-coated tablet (see excerpt from attached e-mail exchange). It comprises three sections relating to different drug products, namely, "an ampoule in two strengths (1 mg/1 ml and 2 mg/2 ml) containing a concentrate for solution for infusion" (pages 2 to 9); "the additional dosage presentation 6 mg/6 ml" (pages 9 to 12); and "Bondronat 50 mg, film coated tablet" (pages 12 to 14). The final section concerns an additional indication (pages 14 to 29). In each of these sections, the drug substance used is identified as being "ibandronic acid, monosodium salt, monohydrate" (see e.g. page 2, "Dosage form"; pages 10 and 12, "Composition"; page 15, last paragraph).

The relevant passages of the section relating to the "Bondronat 50 mg, film coated tablet" are reproduced below (see pages 12 to 14).

5.2.1 "**Drug substance** ... *Manufacture*:

"The synthesis comprises seven steps.
...
No catalysts are used. As solvents acetone, ethanol, methanol, diethylcarbonate, diisopropylether and methylethylketone are used.
...

The substance is a very stable compound as demonstrated by long-term studies. Only under extreme conditions in stress studies (i.e. oxidative conditions), a small increase of phosphate and phosphite was observed."

5.2.2 "*Stability of the Drug Substance*

This is well-known from the first authorisation of the solution for infusion.
Several stress tests were undertaken to induce degradation of the active ingredient. Only in the presence of hydrogen peroxide decomposition occurred, indicated by slightly increasing contents of phosphate, phosphite and two unknown impurities.
Three batches were stored as recommended in the ICH guideline on "Stability Testing of New Drug Substances and Products" (25°C/60 r.h. and 30°C for five years, 40°C and 40°C/75% r.h. for six months). Additionally, results of four batches are included in the stability report as supportive data. All results comply with the specification. ..."

5.2.3 **"Product Development and Finished Product**

The development of this tablet is standard. The active substance is very stable. It is used as a fine crystalline powder and is freely soluble in water, so the tablets dissolve very rapidly in aqueous media: Dissolution >85% after l5 minutes. The film-coating has no effect on the dissolution rate.

A second polymorfic [*sic*] form (B) has been identified, but it has similar solubility and intrinsic dissolution properties to polymorph A and is not expected to affect the tablet performance, if present in the tablets. The

manufacturing processes are expected to produce tablets containing exclusively polymorph A."

5.2.4 **"Stability of the Product**

The active ingredient has been proven to be a very stable compound and this is also reflected in the stability of the product, which has been demonstrated by studies under ICH conditions. Furthermore, during development several batches have been monitored using three different TLC systems and one HPLC method. No significant increase in any degradation product was observed. The limits applied for unspecified impurities also are in line with ICH topic Q3B. ..."

5.3 The problem to be solved in the light of document (30) can be seen as lying in the provision of a polymorphically stable form of ibandronate sodium (cf. e.g. patent in suit, paragraphs [0012], [0016], [0035]).

It is noted that the problem to be solved has been formulated without reference to the "consistent and reliable manner" of production, as proposed by the respondent (cf. above point X), since these aspects purely relate to process features, which are not considered to be relevant to the question of obviousness of the product *per se*, as reflected in claim 1 (see also reasoning in point 5.6.4 below).

The solution as defined in claims 1 to 3 relates to a crystalline form of ibandronate sodium characterised by a number of XRPD peaks (claims 1 and 2) and the corresponding complete XRPD diagram (claim 3).

5.4 In order to render it plausible that the problem defined in point 5.3 has been successfully solved, the respondent relied on the data submitted in in its letter of 20 September 2013 (point 27), and in document (73c). Therein, it is demonstrated that ibandronate sodium form QQ is stable to conversion into other solid-state forms over extended periods of time, at various temperatures and relative humidities, and when subjected to grinding, heating, pressure and milling.

Criticism was raised by the appellants concerning missing details of the measurement conditions. However, the board cannot see that this puts into question the validity of the results obtained. For example, in Figure 1 of document (73c), there is no reason to doubt that, in the absence of any other indication, the diffractograms in question were measured at a constant, ambient temperature.

Based on said evidence, the board is therefore satisfied that the problem posed has been solved.

5.5 It remains to be investigated whether the proposed solution would have been obvious to the skilled person in the light of the prior art.

5.5.1 As outlined above in point 5.2, throughout document (30), the drug substance used in formulating the drug products, both as infusion concentrates and as tablets, is identified as being "ibandronic acid, monosodium salt, monohydrate". The term "monohydrate" would be understood by the skilled person to designate a crystalline solid incorporating one mole of water for every mole of ibandronate sodium (cf. e.g. document (3), page 946, left-hand column, second complete paragraph, third sentence). The stability of this drug

substance is also repeatedly emphasised in document (30), as tested under various conditions, such as oxidative stress, and under storage at high humidity and temperature (see above points 5.2.1 to 5.2.4).

In the first paragraph of the section "Product Development and Finished Product" (above point 5.2.3), the active substance is described as being "a fine crystalline powder". In the following paragraph, it is disclosed that a second crystal form, designated form B, exists, but that "the manufacturing processes are expected to produce **tablets containing exclusively polymorph A**" (emphasis added). In view of this statement, the skilled person is provided with a clear indication that form A of ibandronate sodium monohydrate had been subjected to stress conditions mimicking those encountered during the tableting process, and had been found to exhibit polymorphic stability under these conditions.

5.5.2 The respondent's alternative reading of the section of document (30) entitled "Product Development and Finished Product" (reproduced above in point 5.2.3) is not considered to be convincing for the following reasons:

It cannot be accepted that the skilled person would infer that it did not matter whether either or both polymorphs A and B were present in the tableted product. The statement of document (30) concerning the similar solubilities of forms A and B is followed by the conditional clause "and is not expected to affect the tablet performance, <u>if present</u> in the tablets" (emphasis added). However, the presence of form B in the tablet is not to be expected, since, according to the last sentence of the same paragraph,

the tableted product is expected to exclusively contain one polymorphic form, namely, form A. The respondent further argued that this merely expressed a desired outcome, rather than a statement of fact. However, there could have been no sound basis for expressing such an expectation unless the polymorphic stability of form A had been tested and established under the relevant stress conditions. It is therefore maintained that the skilled person would have derived from the teaching of document (30) a preference for the use of form A in the tableted product, and an expectation that this form would exhibit polymorphic stability.

Contrary to the contention of the respondent, this reading is also consistent with the guidance provided in documents (3) and (4). Thus, according to the decision tree depicted in Figure 1 of document (3), once polymorphs have been discovered, it is then necessary to establish whether they have different physical properties. The following properties are listed as being of interest:

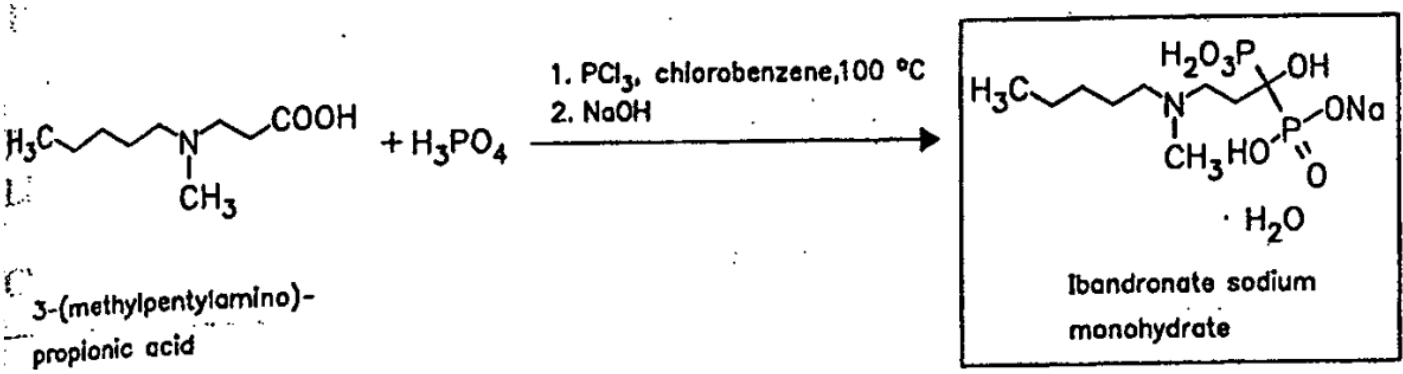
- Stability (chemical & physical)
- Solubility Profile
- Morphology of crystals
- Calorimetric behaviour
- %RH profile

Only "if there are no discernible differences between these physico-chemical properties" (emphasis added), would no further monitoring of polymorph stability be required, in accordance with the further steps of the decision trees (document (3), Figure 1, and pages 947 and 948, sections B to D). Similarly, in decision tree #4(2) of document (4), "solubility, stability, melting point" are listed as properties that may affect "drug product safety, performance or efficacy"; tree #4(3) should only be applied when polymorphism has

been "shown to affect these properties" (emphasis added; see section 3.3.1(c)). Therefore, according to documents (3) or (4), polymorph stability testing would only become redundant when the polymorphs did not differ in all the relevant properties affecting the manufacture and performance of the tablet. However, this does not apply to the situation described in document (30), wherein forms A and B are only disclosed to be similar in one aspect, namely, "solubility and intrinsic dissolution properties".

5.5.3 Consequently, it is concluded that document (30) teaches the existence of a preferred polymorphic form of ibandronate sodium monohydrate with good tableting properties and of high stability, including polymorphic stability. Document (30) therefore provides the skilled person with a strong incentive to seek to obtain such a crystalline monohydrate as a solution to the problem posed.

5.5.4 In view of the fact that document (30) itself does not provide any useful details with respect to the conditions used to obtain ibandronate sodium monohydrate (cf. above point 5.2.1), the skilled person would have sought further information in the literature relating to methods of preparing this drug substance. In this respect, document (74), which is a standard reference book for information on pharmaceutical substances, would be a first point of reference for the skilled person seeking further relevant information. Under the entry for ibandronate sodium monohydrate, the following scheme is disclosed, together with a reference to document (2):



Reference(s):
EP 252 504 (Boehringer Mannh.; appl. 9.7.1987; D-prior. 11.7.1986).

Based on this disclosure in document (74), the skilled person is directly pointed to document (2), and would regard this as a promising avenue to pursue, in the expectation of being able to obtain the target drug substance in accordance with methods taught by this document.

5.5.5 The following analysis refers to the English language family member of document (2), namely, document (2a), in keeping with the submissions of the parties. The corresponding passages in German are to be found in document (2): page 2, lines 24 to 41 and 50 to 54; page 5, lines 47 to 53; examples 7 and 9A; and claims 1 and 3.

Document (2a) relates to diphosphonate compounds of formula (I) and pharmaceutically acceptable salts thereof (column 1, lines 42 to 66 and claim 1). Ibandronic acid is disclosed as a preferred example thereof (column 2, lines 21 to 27; example 9A; claim 4). With respect to the conversion of diphosphonate compounds into their salts, the following is stated in column 5, line 67 to column 6, line 11:

"The free diphosphonic acids of general formula (I) can be isolated as the free acids or in the form of their mono- or dialkali metal salts. The alkali metal salts can usually be readily purified by reprecipitation from water/methanol or from water/acetone.
As pharmacologically acceptable salts, there are preferably used the alkali metal or ammonium salts which can be prepared in the usual way, for example by titration of the compounds with inorganic or organic bases, for example sodium or potassium hydrogen carbonates, aqueous solutions of sodium or potassium hydroxide or aqueous solutions of ammonia or of amines, for example trimethyl or triethylamine."

The reaction conditions for salt formation are illustrated in Example 7 as follows:

"500 mg of the diphosphonic acid prepared according to Example 1 are suspended in 5 ml water, dissolved with 2.68 ml 1N aqueous sodium hydroxide solution, concentrated somewhat and brought to crystallisation by pouring into acetone. There are thus obtained 440 mg (78% of theory) of the disodium salt of 1-hydroxy-3-(N,N-dipentylamino)-propane-1,1-diphosphonic acid in the form of the monohydrate. The melting point is above 300° C."

5.5.6 In view of the fact that Example 7 is the only embodiment to provide a detailed reaction procedure for salt formation, the most obvious initial course of action for the skilled person, seeking to apply the teaching of document (2) to the synthesis of ibandronate sodium monohydrate as disclosed in document (74), would be to follow the procedure of this example accordingly.

As evidence for the outcome of such an adaptation, the appellants referred to the experimental data submitted in documents (39), (52), (53) and (53a).

In these documents, it is demonstrated that, by following the reaction procedure of Example 7, employing ibandronic acid as starting material, the requisite amount of sodium hydroxide, and a reasonable variation of crystallisation conditions within the framework specified, ibandronate sodium monohydrate is consistently obtained, having an XRPD pattern corresponding to that depicted in dependent claim 3, designated in the patent in suit as form QQ (see, in particular, document (39), Tables 1 and 2 and Annexes 2 and 3; document (52), Table I and Figure 1; document (53), pages 1 to 6; document (53a), pages 1 to 3).

Therefore, consistent and convincing evidence has been provided that, by performing routine experimentation within the teaching of document (2), the skilled person would directly arrive at ibandronate sodium monohydrate in the crystalline form QQ, falling within the scope of claims 1 to 3, without the exercise of inventive skill.

5.6 The respondent's arguments in support of inventive step do not hold for the following reasons:

5.6.1 At the time of publication of document (74), the medicinal product Bondronat was only authorised as an infusion concentrate (see "Formulation(s)"; cf. also document (30), pages 2 to 9). However, as explained above (point 5.5.1), according to document (30), the drug substance used in formulating both the infusion concentrates and tablets is disclosed as being one and the same (see also above point 5.2.2, first sentence). The fact that polymorphic monitoring was apparently

only undertaken when developing the tableted product, does not change the identity of the drug substance. The skilled person would therefore have had no hesitation in consulting older literature, such as document (74), when seeking further information relating to methods for obtaining ibandronate sodium monohydrate.

Moreover, as can be seen from above points 5.5.4 and 5.5.5, the reference to document (2) appears directly beneath the scheme depicted in document (74), and the content of the former is in no way inconsistent with the latter, since it not only specifically discloses a method for making ibandronic acid, in accordance with the first step of said scheme, but also teaches how to transform this into its sodium salt, in accordance to the second step. The skilled person would therefore have no reason to doubt that said cross-reference pertains to the scheme as a whole, and not, as argued by the respondent, only to the first step thereof.

5.6.2 Additionally, it has been alleged that the skilled person would be deterred from applying the teaching of document (2), owing to inconsistencies with the process conditions disclosed in document (30). However, the critical steps in the present context are the transformation of ibandronic acid into its sodium salt, and the subsequent isolation thereof. In this respect, there is no inconsistency between the solvents disclosed in documents (2) and (30). In particular, with respect to the water/acetone system employed in example 7 of document (2), it is to be noted acetone is one of the solvents listed as having been used during the manufacturing process of document (30) (cf. above point 5.2.1). Water is not mentioned explicitly in this list; however, this cannot be seen as an inconsistency,

since it is clear from document (30) that only potential residual (organic) solvents are explicitly listed, since the levels thereof are subject to control (cf. page 12, last paragraph).

The respondent further argued that, at best, the skilled person would have looked to the general passages of document (2), but not to Example 7. However, when assessing the teaching of a patent application, the skilled would certainly read the general description in conjunction with the examples, as representing preferred embodiments intended to be illustrative of the more general specification. Therefore, in the present case, before embarking on a screening programme based on the general disclosure of document (2), the obvious initial course of action for the skilled person would be to attempt a simple adaptation following the specific instructions of the only relevant Example 7. In doing so, the skilled person would not have been certain of being able to obtain a suitable crystalline form of ibandronate sodium. However, in view of the clear pointer provided in document (74), it was a straightforward and obvious route to pursue with a reasonable prospect of success.

5.6.3 The respondent's assessment of the experimental data relating to the adaptation of Example 7 of document (2) is also not considered to be persuasive:

The respondent firstly criticised, with reference to its analysis set out in document (73a), that the reproductions relied on by the appellants, as disclosed in documents (39), (52), (53) and (53a), had been performed with the benefit of hindsight, and the conditions adjusted so as to achieve the desired result. However, no convincing case was made that any

gaps in information in the procedure of Example 7 of document (2) had been completed in an unreasonable manner, or contrary to a normal reading of the details provided. In particular, it is specified in Example 7 that the aqueous solution of the diphosphonic acid sodium salt is "concentrated somewhat" and "brought to crystallisation by pouring into acetone". Therefore, a procedure is described for the formation of a crystalline product, involving a moderate reduction in volume, such that the aqueous solution can be added in a continuous stream to acetone, whereby the preposition "into" (rather than "onto") expresses an envelopment on impact and indicates that the volume of the antisolvent is comparable to or in excess of the volume of water. Since the experiments disclosed in documents (39), (52), (53), and (53a) operate in accordance with this general framework, with a reasonable variation in conditions lying within normal routine experimental freedom, such as the relative amounts of water and acetone, temperature of the media, stirring times, and drying temperature and times, the board considers that these represent fair adaptations of Example 7 to the synthesis of ibandronate sodium.

In contrast, the counter-experiments provided by the respondent in document (73b) are not considered to be pertinent. Therein, the aqueous solution obtained with 5 mL of water and 1.34 mL of NaOH 1N solution is concentrated down to a weight of about 1.35 g, and then added by means of a pipette to a flask containing a yet smaller volume of acetone, so as to obtain a mixture containing an excess of water (water:acetone ratio of 3:2, or 4:1). Consequently, this procedure cannot be viewed as representing a faithful adaptation of the procedure taught in Example 7 of document (2), as outlined in the previous paragraph.

The respondent further submitted that, in the aforementioned experiments disclosed in documents (39), (52), (53) and (53a), the claimed polymorph had not been obtained in the vast majority of cases, in view of the fact that one or more of the peaks as claimed in claim 1 were "missing" in the disclosed peak lists (cf. document (73a), paragraphs A14, A36 and A40). However, it can be seen from the diffractograms, in combination with the corresponding peak lists, that the peaks in question are in fact present, but fall outside the claimed error margin of "± 0.2 degrees 2θ". From his general knowledge, as reflected in document (5) (page 2089, right-hand column, last paragraph), the skilled person would be aware of the fact that said error margin relates to the common standard of reproducibility that should be achievable when comparing the pattern of an unknown sample with that of a reference material, measured on the same equipment and under the same conditions. In the present case, the complete XRPD pattern according to dependent claim 3, corresponding to form QQ of the patent in suit, was demonstrated to match those obtained in the experiments of documents (39), (52), (53), and (53a) (see also overlays of selected diffractograms, as depicted in statement of grounds of appeal of appellant opponent 5, pages 13 to 15, and in the letter of 13 May 2015, "3. Inventive Step"). Indeed, in accordance with standard procedures, as reflected in document (5), identity is normally established by comparison of complete XRPD patterns. This was also the approach adopted by the respondent when testing for polymorphic stability (see document (73c)). Therefore, differences attributable to the equipment or precise conditions of measurement used, such as variations in the peak positions somewhat greater than ± 0.2 degrees 2θ, or

incomplete resolution of peaks, cannot qualify as being indicative of formation of a different product. Consequently, it is maintained that the crystalline form of ibandronate sodium monohydrate obtained in documents (39), (52), (53), and (53a) corresponds to form QQ as defined in claims 1 to 3.

5.6.4 Finally, the respondent argued that an inventive step should additionally be acknowledged for the claimed subject-matter, based on the fact that the respondent had been the first to develop a consistent and reliable process for the production of a useful polymorphic form of ibandronate sodium.

However, the board once again wishes to emphasise that the attribute "consistent and reliable manner" relates to a process feature, and is not considered to be relevant to the question of obviousness of the product *per se*, as reflected in claim 1 (cf. above point 5.3). In other words, even were a process to produce variable results in that it sometimes produced a polymorph in pure form, and sometimes contaminated with a second polymorph, the polymorph *per se* would nevertheless be available to the skilled person, either directly or following conventional methods of recrystallisation. Moreover, it cannot be accepted in the present context that Example 7 of document (2) provides insufficient guidance to reliably obtain a single polymorph. Indeed, as analysed above in points 5.5.6 and 5.6.3, the experimental evidence on file does not support this contention.

According to the case law of the Boards of Appeal, "an otherwise obvious entity, may become nevertheless non-obvious and claimable as such, if there is no known way or applicable (analogy) method in

the art to make it and the claimed methods for its preparation are therefore the first to achieve this in an inventive manner" (see T 595/90, OJ EPO 1994, 695, point 5 of the reasons). However, in the present case, this situation does not apply, since, as analysed above, a method was suggested in the prior art allowing the claimed polymorph to be obtained in an obvious manner.

5.7 In view of the above, the board concludes that the closest prior art provides the skilled person with a clear expectation that the solution to the problem as defined above in point 5.3 is to be sought in a crystalline form of ibandronate sodium monohydrate, and that the combined teachings of documents (74) and (2) present him with a promising avenue to pursue in order to achieve this goal, leading to the subject-matter of claims 1 to 3 without the exercise of inventive skill.

Consequently, the main request is rejected for lack of inventive step of the subject-matter of claims 1 to 3.

6. *Inventive step (Articles 52(1), 56 EPC), requests AR1 to AR5, and MRa, AR1a to AR5a*

The assessment presented above in point 5 applies to these requests *mutatis mutandis*.

Thus, the insertion of "monohydrate" in auxiliary requests AR1 to AR3 and AR5 cannot alter the reasoning and conclusions set out above, since this feature is already disclosed in documents (30) and (74), and the monohydrate is also the form obtained when following the teaching according to Example 7 of document (2). Although, as argued by the respondent, the skilled person would not have been certain of this outcome,

it is again maintained that the cross-reference in document (74) provided him with a clear pointer to adopt this course of action.

Moreover, the features incorporated from dependent claims 2 and 3 according to the requests AR2 and AR3 have already been taken into account in the analysis of the main request.

Finally, as explained above in point 5.1, the analysis set out in point 5 was based on a narrow reading of claim 1 as characterising a unique crystalline form, designated "form QQ" in the patent in suit. On this construction, the addition of a product-by-process feature, as in auxiliary requests AR4 and AR5, or the inclusion of the expression "denominated Form QQ", as in series of requests suffixed with "a" (MRa, AR1a to AR5a), cannot alter the substance of the analysis according to above point 5.

Consequently, the respondent's requests AR1 to AR5, and MRa, AR1a to AR5a are rejected for lack of inventive step of their respective claims 1.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The patent is revoked.

The Registrar: The Chairman:

M. Schalow A. Lindner

Decision electronically authenticated