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D E C I S I O N
of 30 October 1998

Case Number: T 0921/94 - 3.3.1

Application Number: 30 October 1998

Publication Number: 91810463.9

IPC: 0463993

Language of the proceedings: EN

Title of invention:

Process for the preparation of aminoanthraquinone derivatives

Applicant:

Ciba Specialty Chemicals Holding Inc.

Opponent:

-

Headword:

Aminoanthraquinone derivatives/CIBA

Relevant legal provisions:

EPC Art. 56, 96(2), 113(1)

EPC R. 67, 68(2)

Keyword:

"Inventive step (yes, after amendment) - problem and solution approach - non-obvious alternative process"

"Procedural violation (yes) - refusal after one communication - legal obligation to issue a further communication under Article 96(2) EPC - obligation to deal with applicant's submissions in substance"

"Reimbursement of the appeal fee (no)"

Decisions cited:

T 0640/91

Headnote:

If an applicant provides *bona fide* submissions and/or technical information in reply to a communication of the Examining Division substantially changing the points at issue, the Examining Division has a legal obligation under Article 96(2) EPC to inform the applicant of the objections under the EPC arising from the new situation and to invite him to provide further observations before issuing a decision to refuse the application (see point 6.2.2 of the decision). A failure to do so amounts to a procedural violation.

A decision, which only comprises a mere formal acknowledgement of the applicant's submissions, without dealing with them in substance, contravenes the general principle of good faith and fair proceedings that reasoned decisions contain at least some reasoning on the crucial points of dispute in order to give the party concerned a fair idea of why his submissions were not considered convincing, and consequently also contravenes Rule 68(2) EPC amounting to a substantial procedural violation too (see point 6.2.3 of the decision).



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Boards of Appeal

Chambres de recours

Case Number: T 0921/94 - 3.3.1

D E C I S I O N
of the Technical Board of Appeal 3.3.1
of 30 October 1998

Appellant: Ciba Specialty Chemicals Holding Inc.
Klybeckstrasse 141
4057 Basel (CH)

Representative:

Decision under appeal: Decision of the Examining Division of the
European Patent Office posted 17 May 1994
refusing European patent application
No. 91 810 463.9 pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: P. Krasa
Members: J. M. Jonk
R. E. Teschemacher

Summary of Facts and Submissions

I. The Appellant (Applicant) lodged an appeal against the decision of the Examining Division refusing the European patent application No. 91 810 463.9 (publication No. 0 463 993) on the ground of lack of inventive step.

II. The decision was based on Claims 1 to 12 as originally filed, Claim 1 reading as follows:

"A process for the preparation of aminoanthraquinone derivatives which comprises reacting (A) bromaminic acid or a metal salt thereof with (B) an aromatic sulphonamide having at least one reactive hydrogen atom attached to nitrogen or an amine having only one primary amine group in an aqueous medium in the presence of a copper(II)salt and an organic reducing agent therefor, the molar ratio of copper(II)salt to (A) being less than 0.05:1."

III. The Examining Division held that the subject-matter of Claim 1 did not involve an inventive step in view of documents

- (1) J. C. S. Perkin II, 1974, pages 676 to 682,
- (2) Chemical Abstracts, 1984, vol. 100 (No. 26), page 86, number 211657r, and
- (3) Chemical Abstracts, 1984, vol. 100 (No. 26), page 86, number 211655p.

In this context, they considered in particular that it would have been obvious to use an amount of copper(II)salt comparable to that of document (1), i.e. 0.02 mol per mol of bromaminic acid or a salt thereof, while increasing the ratio glucose to copper(II)salt so as to determine the best reaction conditions.

IV. The Appellant argued in his grounds of appeal that the process according to Claim 1 involved an inventive step in view of the unexpectedly improved yields of the desired condensation products on changing the glucose to copper(II)salt molar ratio from 1:1 to 5:1 as shown in his test-report as submitted on 19 February 1993. In this context, he emphasised that all the cited documents taught to use a reducing agent to copper(II)salt molar ratio of about 1:1, and that documents (2) and (3) using an organic reducing agent taught to use a high copper(II)salt to bromaminic acid ratio of ten times greater than that of document (1).

Furthermore, the Appellant argued that the decision to refuse the present patent application contravened Articles 96(2) and 113(1) EPC, since the applicant made in his reply to the first and only communication of the Examining Division a bona fide attempt to deal with their objections and also filed comparative test-results to demonstrate the surprising effect of the use of a glucose to copper(II)salt molar ratio of at least 5:1 as claimed in Claim 8 of the present application. In this context, he noted that according to the Guidelines the applicant should have been warned of the intention to refuse and given the opportunity to present further arguments and/or amendments, before a decision to refuse the application was implemented. He

also argued that the decision had not taken count of the arguments put forward by the applicant and introduced grounds for refusing the application on which he had not had an opportunity to reply. He requested therefore the reimbursement of the appeal fee in accordance with Rule 67 EPC.

V. In the annex to the summons to attend oral proceedings the Board informed the Appellant that the technical problem underlying the present patent application in the light of the closest state of the art did not appear to be solved within the whole scope of present Claim 1, since applicants test-report showed that only a very poor yield of the desired aminoanthraquinone derivatives was obtained at a glucose to copper(II)sulphate molar ratio of 1:1.

VI. In reply, the Appellant submitted with his letter of 25 August 1998 new Claims 1 to 12 and new Claims 1 to 11 as auxiliary request.

Claim 1 of his **main request** corresponded to Claim 1 of the claims as originally filed, except that the scope of this claim was restricted to the use of a **molar ratio of reducing agent to copper(II)salt of from 5:1 to 50:1**.

VII. Oral proceedings before the Board were held on 30 October 1998.

During these oral proceedings the Appellant defended inventive step essentially in accordance with his written submissions. Furthermore, he withdrew his request for reimbursement of the appeal fee admitting that the failure of an appropriate auxiliary request could have been a contributive factor leading to a premature decision to refuse the present patent application.

VIII. The Appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the sets of claims submitted with letter dated 25 August 1998 as main and as auxiliary request.

IX. At the conclusion of the oral proceedings the Board's decision was pronounced.

Reasons for the Decision

1. The appeal is admissible.

Main request

2. The subject-matter of present Claim 1 is supported by Claims 1 and 8 of the application as originally filed.

Claims 2 to 7 correspond to those of the originally filed application.

Claim 8 is based on the originally filed Claim 8.

Claims 9 to 12 correspond to the originally filed Claims 9 to 12.

Thus, all claims of the new set of claims comply with the requirement of Article 123(2) EPC.

3. After examination of the citations on file, the Board has reached the conclusion that the subject-matter as defined in all claims is novel. Since this issue was not in dispute, it is not necessary to give reasons for this finding.

4. The remaining issue to be dealt with is whether the subject-matter of the present claims involves an inventive step.
- 4.1 Article 56 EPC sets forth that an invention involves an inventive step if, having regard to the state of the art (in the sense of Article 54(2) EPC), it is not obvious to a person skilled in the art.
- 4.2 For deciding whether or not a claimed invention meets this criterion, the Boards of Appeal consistently apply the "problem-solution-approach", which consists essentially in (a) identifying the closest prior art, (b) assessing the technical results (or effects) achieved by the claimed invention when compared with the closest state of the art established, (c) defining the technical problem to be solved as the object of the invention to achieve these results, and (d) examining whether or not a skilled person starting from the closest prior art **would** arrive at something falling within Claim 1 by following the suggestions made in the prior art in the sense of Article 54(2) EPC.
- 4.3 According to the consistent case law of the Boards of Appeal the closest prior art for assessing inventive step is normally a prior art document **disclosing subject-matter conceived for the same purpose as the claimed invention** and having the most relevant technical features in common.
- 4.4 Moreover, it is observed by the Board that, in applying the "problem-solution-approach", the technical problem to be considered is likely to be that apparent from the present patent application/patent in suit, unless strong reasons would speak against this, such as

starting from an inappropriate state of the art for defining the technical problem to be solved, the absence of sufficient evidence that the stated problem has been solved by the claimed invention, or the fact that the technical problem as indicated in the present application/patent in suit has already been solved. In such cases, a reformulation of the underlying technical problem may become necessary.

4.5 In the present case, the **technical problem as apparent from the present patent application** has been seen in the provision of a process for the preparation of certain aminoanthraquinone compounds in **high yields** rendering it possible to reduce the amount of the copper catalyst, so that **the effluents and products only contain very low levels of copper** (see page 1, third paragraph, line 6 to page 2, second paragraph, of the originally filed application).

4.6 Given this objective, the Board considers - in agreement with the Examining Division and the Appellant - that the **closest state of the art is document (1)**, because this document discloses the production of the desired aminoanthraquinone compounds in **yields up to 95.3%** by reacting bromaminic sodium salt with aniline in the presence of copper(II)sulphate and a reducing agent therefor, whereby the copper(II)sulphate is used in an amount of **only 0.02 mol per mol of the bromaminic acid sodium salt** (see Table 1).

4.7 Thus, having regard to the fact that the technical problem as indicated in the present patent application has already been solved by the process of document (1), the Board sees the technical problem underlying the present patent application in the light of the closest

state of the art in the provision of an **alternative process** for the preparation of the desired amino-anthraquinone compounds using small amounts of copper catalyst.

- 4.8 The present patent application suggests, as the solution to this problem, a process according to Claim 1 using an **organic reducing agent** and a molar ratio of this agent to the copper(II)salt of from 5:1 to 50:1 as essential features.
- 4.9 Having regard to the examples of the present patent application showing yields up to 99% (Examples 1 and 2), and in view of the results of Appellant's test-report of 19 February 1993 demonstrating that by using a molar ratio of reducing agent to copper(II)salt of 5:1 a conversion of 97,5% was achieved, whereas at a ratio of 1:1 a conversion of only 5.5% was obtained, the Board considers it plausible that the technical problem as defined above has been solved.
- 4.10 The question now is whether the cited documents would have suggested to a person skilled in the art solving the above-indicated technical problem in the proposed way.
- 4.11 Document (1) discloses - as indicated above under point 4.6 - a process for the preparation of the desired aminoanthraquinone compounds in high yields by reacting bromaminic acid sodium salt with aniline in the presence of copper(II)sulphate and a reducing agent therefor, whereby the copper(II)sulphate is used in an amount of 0.02 mol per mol of the bromaminic acid sodium salt. However, as suitable reducing agents only **metal reducing agents** are mentioned, namely Sn^{2+} , Ti^{3+}

and Fe^{2+} (see in particular page 678, right column, last paragraph). Moreover, it discloses the use of **equimolar amounts** of these metal reducing agents and copper(II)sulphate (see Table 1). Therefore, in the Board's judgment, document (1) does not give any pointer to the skilled person that the technical problem underlying the present patent application as defined above could be solved in accordance with present Claim 1.

- 4.12 Documents (2) and (3), which are both abstracts of patent publications, relate to the preparation of anthraquinone derivatives by condensation of bromaminic acid with aliphatic or aromatic amines in the presence of a copper catalyst formed in the reaction mixture by treating Cu-salts with mild reducing agents. In particular, document (2) discloses the condensation of bromaminic acid with cyclohexylamine in the presence of **copper(II)sulphate and glucose in a weight ratio of 5 to 3.6**, whereas document (3) describes the conversion of bromaminic acid with 1,3-diamino-4-benzenesulphonic acid in the presence of **copper(II)sulphate and glucose in a weight ratio 7.5 to 5.4**. Thus both documents disclose the use of a molar ratio of glucose to copper(II)sulphate of 1:1. Moreover, documents (2) and (3) disclose the use of copper(II)sulphate in amounts of **0.2 mol** and **0.3 mol**, respectively, per mol of bromaminic acid. Therefore, a skilled person faced with the present technical problem, i.e. finding an alternative process with respect to that of document (1) rendering it possible to use low amounts of copper catalyst, so that the effluents and products only contain very low levels of copper, in the Board's judgment, would not have had any reason to consider these documents as a possible source of useful

information for solving his problem, because they clearly teach that the use of glucose as reducing agent is connected with the use of high amounts of copper catalyst, namely amounts of 10 and 15 times higher than the amount of 0,02 mol copper salt per mol bromaminic acid sodium salt as indicated in document (1).

Even if the skilled person, in view of documents (2) and (3), would have tried to replace the metal reducing agents of document (1) by glucose, while maintaining the small amount of 0.02 mol copper(II)salt per mol of bromaminic acid sodium salt as taught in document (1) and a molar ratio of the reducing agent to the copper(II)salt of 1:1 as taught in all the cited documents, he would have found that the above defined technical problem underlying the present patent application would not be solved, because in doing so only a very poor yield would be obtained as has been shown by the Appellant in his test-report (see above point 4.9).

4.13 In this context, the Examining Division held in their decision that it would have been obvious to use an amount of copper catalyst comparable to the one as disclosed in document (1), while increasing the ratio glucose to copper(II)sulphate so as to determine the best reaction conditions (see points 9.4 and 9.6.2 of the decision).

4.14 The Board notes in this respect that a skilled person indeed could have used a higher glucose to copper(II)salt molar ratio as the one disclosed in the cited documents. However, according to the consistent case law of the Boards of Appeal for determining lack of inventive step, it is necessary to show that

considering the teaching of the relevant prior art as a whole, without using hindsight based on the knowledge of the claimed invention, the skilled person would have arrived at the **claimed solution of the technical problem to be solved**. However, as indicated above, a skilled person, when trying to solve the technical problem underlying the patent in suit, would not have found any reason in the state of the art to replace the molar ratio glucose to copper(II)salt of 1:1 by a ratio as high as 5:1 as claimed according to the present patent application.

4.15 Therefore, in the Board's judgment, the Examining Division's point of view is void since it is based on information available only from the application in suit and, thus, on typical *ex post facto* considerations.

4.16 In conclusion, the Board finds that the process for the preparation of aminoanthraquinone derivatives according to present Claim 1 involves an inventive step in the sense of Article 56 EPC.

Since Claims 2 to 12 relate to particular embodiments of the process as claimed in Claim 1, they are also allowable.

Auxiliary request

5. In the light of the above findings, it is not necessary to consider the Appellant's auxiliary request.

Reimbursement of the appeal fee

6. According to Rule 67 EPC the reimbursement of the appeal fee, which can be examined by the Board even in the absence of a request to this effect, can be ordered only if such reimbursement is **equitable** by reason of a substantial procedural violation.

6.1 In the circumstances of the present case, wherein the main claim under consideration before the first instance did not comprise as an essential feature the ratio of reducing agent to copper(II)salt of at least 5:1, and the Appellant failed to submit a proper auxiliary request and withdrew his request for reimbursement, the Board does not see any reason to reimburse the appeal fee.

6.2 Nevertheless, it seems appropriate to deal with the Appellant's submissions concerning a substantive procedural violation by the Examining Division, since the course of action taken by the Examining Division should be generally avoided.

6.2.1 In his reply to the only communication the Appellant disputed the preliminary point of view of the Examining Division that the process of the present patent application lacked inventive step having regard to the cited documents, by submitting that documents (2) and (3) taught that the process as disclosed therein could only be carried out by using much larger amounts of copper catalyst than were known to be required in the process of document (1), so that the skilled person would have been **deterred from investigating** the use of the organic reducing agents of documents (2) and (3) when trying to achieve low levels of copper in

effluents and products. Moreover, he submitted in reply to the Examining Division's contention regarding the subject-matter of the dependent Claims 7 and 8 that it appeared to be obvious to the skilled person to try to use the lowest possible amount of copper salt with the most adequate quantity of reducing agent to achieve said purpose (see under point 7 of the Examining Division's communication), a test-report. The data of this report - as indicated above - demonstrated that by using a molar ratio of reducing agent to copper(II)salt of 5:1 in accordance with Claim 8 of the present patent application surprisingly a conversion of 97,5% was achieved, whereas at a ratio of 1:1 a conversion of only 5.5% was obtained, and consequently showed that this molar ratio of 5:1 actually **constituted an essential feature of the claimed invention.**

6.2.2 The Appellant's *bona fide* submissions and the technical information provided by his test-report **substantially changed the points at issue** and the Examining Division had a **legal obligation** under Articles 96(2) and 113(1) EPC to inform the Appellant of the objections under the EPC arising in the new situation and to invite him to provide further observations before issuing a decision to refuse the application (see e.g. T 640/91, OJ EPO 1994, 918). A failure to do so amounts to a procedural violation.

6.2.3 Furthermore, in the present case, the decision under appeal neither comprises any consideration with respect to the Appellant's test-report, nor contains it any reasoning why it would have been obvious to try to use high ratios of reducing agent to copper(II)salt of at least 5:1 as claimed in Claim 8, but only a non-

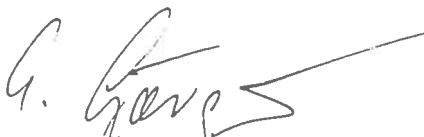
substantiated allegation to that end. Actually, it only comprises a mere formal acknowledgement of the Appellant's submissions (see point 9.3 of the decision), without dealing with them in substance, so that the Appellant has not been given a fair idea of why his submissions were not considered convincing. Therefore, in the Board's judgment, the decision under appeal does not meet the requirements of Rule 68(2) EPC in that it has not been sufficiently reasoned, which failure amounts to a substantial procedural violation too.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the first instance with the order to grant a patent with Claims 1 to 12 submitted with letter dated 25 August 1998 as main request and a description yet to be adapted.

The Registrar:


E. Gorgmaier

The Chairman:


P. Krasa

