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D E C I S I O N
of 16 June 1998

Case Number: T 0932/96 - 3.3.1

Application Number: 87104293.3

Publication Number: 0239910

IPC: C11D 1/62

Language of the proceedings: EN

Title of invention:
Biodegradable fabric softeners

Patentee:
The Procter & Gamble Company, et al

Opponent:
Unilever Plc/Unilever NV
KAO Corporation
Stepan Europe S.A.

Headword:
Fabric softeners/PROCTER & GAMBLE

Relevant legal provisions:
EPC Art. 56

Keyword:
"Business letter - availability to the public (yes)(points 2.4.4.1 to 2.4.4.5)"
"Inventive step (no) - obvious to try (point 2.4.5)"

Decisions cited:
T 0482/89

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0932/96 - 3.3.1

D E C I S I O N
of the Technical Board of Appeal 3.3.1
of 16 June 1998

Appellant I: (Proprietor of the patent)
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Decision under appeal: **Interlocutory decision of the Opposition Division of the European Patent Office posted 8 August 1996 concerning maintenance of European patent No. 0 239 910 in amended form.**

Composition of the Board:

Chairman: A. J. Nuss
Members: P. Krasa
W. Moser

Summary of Facts and Submissions

I. The present appeals were lodged against the Opposition Division's interlocutory decision that the European patent No. 0 239 910, relating to biodegradable fabric softeners, complies in amended form with the requirements of the EPC.

II. Three notices of oppositions were filed against the European patent, raising objections under Article 100(a) EPC (lack of novelty and of inventive step), Article 100(b), and (c) EPC citing a number of documents, in particular

(3) EP-A-0 040 562

(48) Letter from Stepan to INRS of 2 May 1985

(50) Letter from Stepan to TENSIA of 28 May 1985.

In the course of the opposition proceedings, the parties cited additional documents, inter alia

(57) Chemical Kinetics Vol. 10, 153 to 155; (BAMFORD and TIPPER, editors) Elsevier [1972],

(65) EP-A-0 122 140, and

(67) US-A-4 228 042.

III. The Opposition Division decided that the subject-matter of claim 1 of the Appellant's I (Patent Proprietor's)

then pending second auxiliary request met the requirements of Article 123(2) and (3) EPC and was novel.

Further, it found that the technical problem to be solved was to improve the stabilities of the fabric softening agents concerned against hydrolysis and that this problem was solved by selecting the particular pH range of claim 1. The Opposition Division concluded that this solution involved an inventive step, since the cited documents did not point to this pH range and, in particular, document (67) pointed to pH values above 8 for optimum stability of the biodegradable fabric softeners.

IV. Both Appellant I and Appellant II (Opponent 01) lodged an appeal against this decision.

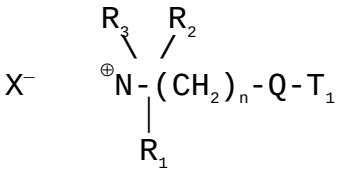
Appellant I introduced into the proceedings the document

(70) STEPAN, "Dialkylesterammoniums quaternaires et leurs propriétés".

V. In reply to a communication from the Board pursuant to Article 11(2) of the Rules of Procedures of the Boards of Appeal, Appellant I submitted on 14 May 1998 a new main request and five new auxiliary requests (auxiliary requests A to E).

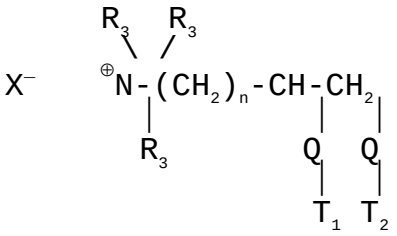
The **main request** comprised one independent and nine dependent claims. Independant claim 1 reads:

"1. An aqueous fabric softening composition with excellent hydrolytic stability on storage, containing from 2% to 29% of a biodegradable quaternary ammonium compound softening agent of the formula I or II:



(I)

or



(II)

wherein

Q is -O-C(=O)-

R_1 is $(CH_2)_n$-Q-T_2 or T_3;

R_2 is T_4 or R_3;

R_3 is C_1-C_4 alkyl;

T_1, T_2, T_3 and T_4 are the same or different C_{12}-C_{22} alkyl or alkenyl;

n is an integer from 1 to 4; and

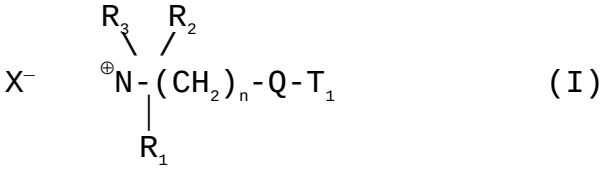
X^- is a softener compatible anion,

and, if desired, conventional matrix components and additives, characterized in that the composition comprises an added Bronstedt acid selected from the group consisting of inorganic mineral acids, low molecular weight (C_1-C_5) carboxylic acids and alkylsulfonic acids so that the composition has a pH,

at 20°C, of from 2.5 to 4.2, upon dilution, in de-ionized water, to a concentration of 0.5% to 1% of said biodegradable quaternary ammonium, with the exclusion of compositions containing 5% of a quaternary ammonium compound of formula (II), wherein Q is -O-CO-, R_3 is methyl, T_1 and T_2 are both tallowyl having the chain length distribution of C_{14} 5%, C_{16} 30%, C_{18} (saturated) 20%, and C_{18} (unsaturated) 45%, and X is the chloride anion."

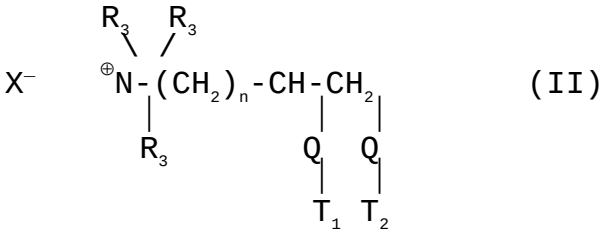
Claim 1 of **auxiliary request A** read as follows:

"A process for the manufacture of an aqueous fabric softening composition with excellent hydrolytic stability on storage, containing from 2% to 29% of a biodegradable quaternary ammonium compound softening agent of the formula I or II:



(I)

or



(II)

wherein

Q is -O-C(=O)-;
R_1 is $(CH_2)_n$-Q-T_2 or T_3;
R_2 is T_4 or R_3;
R_3 is C_1-C_4 alkyl;
T_1, T_2, T_3 and T_4 are the same or different C_{12}-C_{22} alkyl or alkenyl;
n is an integer from 1 to 4; and
X^- is a softener compatible anion,
and, if desired, conventional matrix components and additives, characterized by regulating the pH of the composition by adding a Bronstedt acid selected from the group consisting of inorganic mineral acids, low molecular weight (C_1-C_5) carboxylic acids and alkylsulfonic acids so that the composition has a pH, at 20°C, of from 2.5 to 4.2 upon dilution, in de-ionized water, to a concentration of 0.5% to 1% of said biodegradable quaternary ammonium."

Claim 1 of **auxiliary request B** differed from claim 1 of auxiliary request A in so far as

"characterized by regulating the pH of the composition by adding a Bronstedt acid selected from the group consisting of inorganic mineral acids, low molecular weight (C_1-C_5) carboxylic acids and alkylsulfonic acids so that"

was replaced by

"characterized by injecting a melt of said biodegradable quaternary ammonium compound into a waterseat to which a Bronstedt acid selected from the

group consisting of inorganic mineral acids, low molecular weight (C_1-C_5) carboxylic acids and alkylsulfonic acids has been added so that".

Claim 1 of each of **auxiliary requests C, D and E** differs from the respective claim 1 of the main request and of auxiliary requests A and B in that

"from 2.5 to 4.2" was replaced by "from 3.4 to 4.2".

The claims of **auxiliary request E** were identical with those of the patent as maintained in amended form by the Opposition Division.

VI. Appellant I submitted in essence

- that the claims according to all the requests now on file were clear and concise, supported by the description and did not infringe Article 123(2) and (3) EPC;

- that the patent in suit, and in particular its example 1, disclosed all the information required by a skilled person to carry out the claimed invention;

- that the subject-matter of the claims according to the main request was novel over all the citations;

- that the **problem to be solved** by the claimed subject-matter was to provide an aqueous fabric softening composition, which comprised a biodegradable quaternary ammonium compound (BQAC)

as defined, having, apart from the desired fabric softening properties, also an **excellent hydrolytic stability and improved storage stability** and/or a process for its manufacture;

- that the compositions claimed or resulting from the claimed processes in accordance with Appellant I's requests exhibited a surprisingly improved stability when regulated to the pH range as defined in the claims by the addition of one of the specified Bronstedt acids, which effect was confirmed by storage tests at 50°C and further storage tests at room temperature, the results of which were submitted in Appellant I's letters of 19 April 1994, 10 September 1997 and 14 May 1998;

- that this beneficial effect could not be achieved by the presence of fatty acids in the compositions concerned;
- that, with respect to the underlying technical problem, the documents alleged as suitable starting points by Appellant II did not provide any useful information;

- that document (50) did not belong to the state of the art and that, therefore, Respondent II (Opponent 03) did not inform the public of the very good hydrolytic stability of their fabric softening quaternary ammonium compounds within the claimed pH range specifically at around pH 3; and

- that none of the citations rendered the claimed

invention obvious.

VII. Appellant II submitted in essence

- that the respective claims 1 of Appellant I's auxiliary requests B and E were not admissible under Article 123(2) EPC;

- that the claims according to all the requests were lacking clarity and support by the description;

- that the alleged invention was not sufficiently disclosed;

- that, furthermore, the subject-matter of claim 1 of the main request and of auxiliary request C now on file was not novel over document (2) or (3);

- that document (50) was state of the art;

- that, taking the state of the art as disclosed e.g. in document (3) as starting point for the evaluation of inventive step, the subject-matter claimed according to all requests was obvious for the skilled person since it was generally known in the art that esters had an optimum or optimum range of stability dependent on the pH and that a skilled person would have looked for such optimum, if there had been a need to improve the stability;

- that in respect of auxiliary requests (B) and (E), the process feature of injecting the molten quaternary ammonium compound into water comprising

a Bronstedt acid was known from document (65) and that there was no inventive step in using a known processing route;

- that Appellant I had admitted that process features were not essential features of the claimed invention.

VIII. Respondent II endorsed Appellant II's arguments and maintained in particular that document (50) was not confidential but informed the public that the products STEPANTEX VR 85 and VP 85 had an optimum of stability at a pH of about 3.

IX. Respondent I (Opponent 02) did not comment on the issues of the present case.

X. In the course of the oral proceedings, which took place on 16 June 1998, Appellant I submitted an amended auxiliary request A which differed from the former one by the amendment of two obvious clerical errors in claims 2 and 7.

XI. Appellant I requested that the decision under appeal be set aside and the patent be maintained on the basis of the following documents:

(a) claims 1 to 10, filed on 14 May 1998 as main request, or

(b) claims 1 to 10, submitted during oral proceedings as auxiliary request A, or

(c) claims 1 to 10, filed on 14 May 1998 as auxiliary request B, or

(d) claims 1 to 9, filed on 14 May 1998 as auxiliary request C, or

(e) claims 1 to 9, filed on 14 May 1998 as auxiliary request D.

As a further auxiliary request E, filed on 14 May 1998, Appellant I requested that the appeal lodged by Appellant II be dismissed.

Appellant II requested that the decision under appeal be set aside and the patent revoked.

Respondents I and II requested that the appeal lodged by Appellant I be dismissed.

XII. At the end of the oral proceedings the Chairman announced the Board's decision.

Reasons for the Decision

1. *Amendments, clarity, sufficiency of disclosure, novelty*

1.1 The Board is satisfied that the amendments in the claims according to the main request and auxiliary requests A to E are duly supported by the application as filed, do not extend the protection conferred by

the European patent as granted and do not render these claims unclear.

1.2 The Board is also satisfied that the alleged invention is sufficiently disclosed in the patent in suit and is not anticipated by any of the citations on file.

1.3 The Board concludes that, therefore, all the claims of the main request and of auxiliary requests A to E comply with the requirements of Articles 54, 83, 84, and 123 EPC. Since all these requests fail for lack of inventive step (Article 56 EPC) as set out hereinafter, it is not necessary to deal further with these matters.

2. *Inventive step*

2.1 According to the patent in suit the technical problem to be solved should be seen in improving the stability of the softening agents concerned against hydrolytic degradation upon prolonged shelf storage (see page 2, lines 18 to 23).

2.2 Closely related softening compositions containing BQACs are disclosed in a number of documents. The patent in suit reveals that concentrated compositions containing BQACs were known, e.g. from document (3), but could encounter hydrolytic stability problems upon prolonged shelf storage and that, therefore, BQAC compositions should be provided with sufficient shelf stability (page 2, lines 16 to 21).

2.2.1 Document (3) generically discloses compositions

comprising 3% to 10% of a fabric softening agent encompassing those of the present formula I (page 1, lines 3 to 5, and page 5, line 33, to page 6, line 14). N,N-dimethyl-N,N-di-(stearoyloxyethyl) ammonium chloride, - metho sulfate, and N,N-dimethyl-N,N-di-(palmitoyloxyethyl) ammonium chloride are mentioned, inter alia, as possible individual quaternary ammonium compounds (page 6, lines 20 to 24). These three BQACs are compounds of the present formula I. In examples 1 and 7, respectively, the preparation of dispersions in tap water of N,N-di-(ß-C_{14}-C_{18}-acyloxyethyl)-N-ß-hydroxyethyl-N-methyl ammonium metho sulfate in the presence of other additives and of 2-alkyl-1-ethyl-1-stearoylamidoethyl imidazolinium ethyl sulfate in the presence of sodium p-toluene sulfonate are disclosed (page 10, lines 19 to 24 and page 12, lines 31 to 34).

2.2.2 The Board can accept both document (3) as a starting point for the evaluation of inventive step and the technical problem defined in the patent in suit in respect of this citation.

2.3 In his submission dated 14 May 1998, Appellant I submitted, as an extension of the data shown in table 1 of his letter dated 16 December 1996 (which in turn was based on the table on page 10 of the patent in suit), a graphic representation of the pH dependence of the stability of N,N-di-(tallowoyloxy-ethyl)-N,N-dimethyl ammonium chloride upon storage for 12, 27, and 49 weeks at room temperature (page 4, second paragraph, in combination with lines 9 to 11 on page 4 of Appellant I's letter of 10 September 1997

and the paragraph bridging pages 7 and 8 of his letter of 16 December 1996). It shows the stability as a bundle of curves with shapes varying between rather broad and flat (12 weeks' storage) and parabola-like (49 weeks' storage), the maxima of these curves being centred around a pH value of approximately 2.9. Upon storage for 49 weeks, the hydrolytic stability is about 99% at this pH value, decreasing to less than 75% at pH values above 4.2 and to less than 95% at pH values below 2.5 (e.g roughly 66% at a pH value of about 1.8). These findings are corroborated by Appellant I's storage tests at 50°C (page 6 of the letter dated 14 May 1998). If one accepts in Appellant I's favour that the compositions having a pH outside the range of from 2.5 to 4.2 are representative for compositions of the state of the art as disclosed in document (3), the solution claimed according to claim 1 of the main request shows an improved storage stability and, thus, solves the existing technical problem.

2.4 It remains to be decided whether or not the subject-matter of claim 1 of the main request involves an inventive step.

2.4.1 Appellant I repeatedly emphasised that the state of the art was completely silent on the problem of hydrolytic stability of the respective BQACs, which problem had therefore not been recognised in the state of the art. In the Board's judgment, the fact that Appellant I came across this problem for the first time cannot contribute to inventive step, since

hydrolytic storage problems of the BQACs would have been noticed by a skilled person dealing with such softener compositions and concerned with overcoming such drawbacks as part of its normal task (see the decisions cited in 'Case Law of the Boards of Appeal of the European Patent Office' 1996, Chapter I, Patentability, in the first paragraph under D 6.9).

2.4.2 Appellant I did not contest that a skilled person knew from the common general knowledge in the field of chemistry that a given ester has - in dependence from the pH - an area of maximum hydrolytic stability, the position and the shape of the stability maximum being linked to its chemical structure (see e.g. document (57), page 153, Figure 13, which gives approximate pH-rate profiles for the hydrolysis of various esters). When questioned on this during oral proceedings, Appellant I confirmed that a skilled person would have expected the existence of a stability maximum also for the compounds of formulae I and II of claim 1 of the main request.

2.4.3 However, he contended that in the present case the skilled person would have had no idea which pH would lead to a stability maximum of the softener composition and that, therefore, establishing the appropriate pH range required inventive skills.

2.4.4 The Board cannot accept this argument in view of document (50), which Appellant I considered however not to be a document which could be cited against the claimed invention.

2.4.4.1 This citation is a business letter from Respondent II to a customer, TENSIA (Belgium), dated 28 May 1985. This letter, which contained no indication at all that its contents should be treated as confidential, informed in particular of two aqueous compositions containing the two biodegradable cationic textile softeners STEPANTEX VR 85 and STEPANTEX VP 85 and gave price quotations for these compositions comprising 5% and 15% of active ingredient, respectively (page 1). Near the end of page 2 of the same letter the following sentence is to be found (English translation by the Board):

"Finally, we draw your attention to the fact that our STEPANTEX are biodegradable because of their structure and that the stability of the molecule has its optimum at a pH of about 3."

No chemical formula or name is given in this letter for STEPANTEX VR 85 and STEPANTEX VP 85.

2.4.4.2 Appellant I contested that this letter made available to the public its technical contents which therefore, so he concluded, were not state of the art. He argued that it was a piece of internal correspondence between two particular partners to which the public would not have had access and that, in spite of the fact that no confidentiality obligation was indicated, it had to be assumed that there was an unwritten confidentiality agreement between the partners covering the subject-matter of this letter. In this context, Appellant I referred to document

(48) in support of his allegation. This document is a letter of 3 June 1981 from Respondent II to INRS (Paris) relating to STEPANTEX Q 185 and bears on the top of its first page the note (in French) "CONFIDENTIELLE". According to Appellant I, this clearly showed Respondent II's intention to keep secret all the information on STEPANTEX products, which consequently applied also to document (50).

2.4.4.3 Appellant I's arguments cannot convince the Board. No relation between the addressees INRS (Paris) and TENSIA (Belgium) has been established or could be assumed. Therefore, there exists no connection between the two letters (48) and (50), which consequently have to be treated separately and independently from one another.

2.4.4.4 In the absence of any evidence to the contrary, document (50) is, in the Board's judgment, merely a business letter containing a sales offer for and technical information on products, as is common practice in normal relations existing between a manufacturer and a (potential) customer, without any further obligations, either explicit or implicit, resulting therefrom for the business partners. The Board finds in particular that there is nothing at all in document (50) to suggest some kind of a development co-operation or any other special relationship between the parties going beyond a routine business relationship which might have justified concluding that there existed a particular confidential relationship between the parties concerned. Therefore, and in view of Appellant I's

concession that he could only assume but not prove the existence of a secrecy obligation on behalf of TENSIA (Belgium), this submission is based on mere speculation and is not accepted by the Board.

2.4.4.5 It follows from the above that the addressee TENSIA (Belgium) is a member of the public not bound by any secrecy obligation and that document (50) was available to the public; its contents are, therefore, state of the art within the meaning of Article 54(2) EPC. It is not necessary to prove that additional members of the public also had knowledge of that document and its contents (see also T 0482/89, OJ 1992, 646, point 3 of the Reasons for the Decision).

2.4.4.6 Document (70), relied on by Appellant I in this context, is a company brochure from Respondent II. As Appellant I confirmed, it was made available to the public in 1988, as is apparent from a handwritten annotation on its last page, and is not state of the art. It provides information, inter alia, on the stability of two compositions containing "STEPANTEX (dialkylesterammonium à 90%)" without making reference to the pH of the compositions (top of page 8 and pages 9 to 11). According to Appellant I, this would prove that it has never been Respondent II's intention to inform the public of the pH value of the maximum stability of the STEPANTEX products. However, the mere fact that specific information is not comprised in a particular document does not prove that this information should not be (or has not already been) published at all. Therefore, the Board does not agree that document

(70) indicates the confidential character of the contents of document (50).

2.4.4.7 Thus, the Board concludes that those skilled in the art knew from document (50) that cationic, biodegradable fabric softeners had a stability optimum at a pH value of around 3. Even without information on the exact chemical structure of these compounds, a skilled person would have been struck by this technical teaching, since it was the only information available in the art dealing with the stability aspect of biodegradable cationic softener compounds.

2.4.5 In view of the common general knowledge (see point 2.4.2, above), it was not only obvious for a person skilled in the art to search for the pH range, where the compounds of formulae I and II would have optimum hydrolytic stability, by doing no more than routine experimentation but, having regard to the information provided in document (50), it was in particular obvious to try, with a reasonable expectation of success, to adjust to that end the pH to a value of around 3, which value is close to the centre of the claimed pH range according to the main request.

2.4.6 The Opposition Division argued that a skilled person would have firstly investigated the basic pH range when searching for a solution to the existing technical problem, since document (67) disclosed a pH below 11, preferably below 10 but above 8 for avoiding hydrolysis of BQACs (the paragraph bridging pages 19 and 20 of the decision under appeal).

2.4.7 This argument is not convincing. The relevant passages of document (67) read:

"Where this type of biodegradable cationic surfactant is used, it is preferred that the detergent compositions have a pH of not greater than about 11, preferably less than about 10, in the laundry solution, in order to minimize hydrolysis of the cationic surfactant" (column 11, lines 50 to 52) and

"Particularly preferred compositions have a pH of at least about 8 in the laundry solution, in order to improve the removal of body soil" (column 3, lines 33 to 36).

Thus, these passages relate to the laundry performance of the respective BQACs and their behaviour in the laundry solution but have nothing to do with their storage stability in the compositions to be later added to the laundry solution. This finding is corroborated by the passage preceding the last sentence quoted above from document (67). There, it is disclosed that the respective compositions may be formulated to have a pH of at least 6, preferably greater than about 7 "in order to optimize cleaning performance", since "the particulate soil removal capabilities of the compositions tend to decrease" at a pH below 6 (column 3, lines 26 to 33). Thus, document (67) teaches how to compromise between high particulate soil removal and reduction of alkaline hydrolytic decomposition in the laundry solution of the BQACs, but is silent on the problem of

insufficient hydrolytic stability of these compounds **on storage**. Therefore, the Board concludes that the skilled person would have disregarded document (67) when looking for a solution to the technical problem underlying the patent in suit.

2.4.8 Appellant I also emphasised that a group of particular acids was specified in claim 1 of the main request as the means for the pH adjustment and that the addition of fatty acids to the compositions concerned would not give the beneficial effect aimed at. However, the acids applied are Bronstedt acids, such as inorganic mineral acids. These are the most conventional means which a skilled person would consider immediately for "regulating the pH" in aqueous systems. In fact, the alleged "selection" of Bronstedt acids includes all acids normally used for such purpose. The exclusion of acids which a skilled person would not have used anyway because of foreseeable difficulties (such as the low solubility of fatty acids in water) cannot render this feature non-obvious.

2.4.9 It follows from the above that the subject-matter of claim 1 of the **main request** was obvious to the skilled person vis-à-vis documents (3) and (50) and does not involve an inventive step (Article 56 EPC).

2.5 Apart from the missing disclaimer, process claim 1 of auxiliary request A is formally distinguished from claim 1 of the main request by the process feature "... regulating the pH of the composition by adding a Bronstedt acid ...". As set out in point 2.4.8, the

addition of a Bronstedt acid to a composition for regulating the pH of the latter being well known as such, the process would only be non-obvious if the resulting composition was inventive. This not being the case for the reasons given above, it follows that claim 1 of **auxiliary request A** does not involve an inventive step.

2.6 Claim 1 of auxiliary request B differs from that of auxiliary request A by specifying the process feature as "... by injecting a melt of said biodegradable quaternary ammonium compound into a waterseat to which a Bronstedt acid selected from ... has been added ..." (see above point V). Appellant I has not provided any evidence that this process feature, which was known as such from example 6 of document (65) (page 15, first paragraph), was of technical relevance for obtaining the beneficial result aimed at, i.e. improved storage stability. On the contrary, he stated during the examination proceedings - as was pointed out by Appellant II in lines 13 to 14 on page 5 in his fax of 19 May 1998 - that "... the present invention is based on a specific pH range which ensures maximum hydrolytic stability; how this is achieved is not essential ..." (letter dated 5 April 1991, page 1, lines 7 to 9 from the bottom). Therefore, the Board concludes that this feature does not render the claimed process inventive and that the subject-matter of claim 1 of **auxiliary request B** does not involve an inventive step.

2.7 The same arguments apply in principle also to respective claim 1 of each of auxiliary requests C, D

and E. These latter claims differ from the former ones in that the lower limit of the pH range is 3.4 instead of 2.5. Whereas the pH range of from 3.4 to 4.2 no longer comprises the figure "3" mentioned in document (50), this range is still in the neighbourhood of a pH of around 3, to which the skilled person was alerted by document (50) when looking for a better hydrolytic stability of the compounds concerned. Moreover, this pH range no longer embraces the maximum of the storage stability shown at pH 2.9, but only some intermediate stability values (see point 2.3, above). Therefore, in the Board's judgment, the limitation of the pH range in auxiliary requests C, D and E is arbitrary and cannot help to improve Appellant I's case. Indeed, the Board considers that once it is established that the skilled person knows what to do in order to determine the pH range likely to lead to the best possible hydrolytic stabilities, it cannot be an inventive measure to leave out that part of the range for which the desired improvement would be highest. It follows that the subject-matter of claim 1 of each of **auxiliary requests C, D and E** does not involve an inventive step.

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:

E. Görgmaier A. Nuss