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**Datasheet for the decision
of 17 May 2021**

Case Number: T 2772/19 - 3.3.02

Application Number: 13727188.8

Publication Number: 2861569

IPC: C07D291/06

Language of the proceedings: EN

Title of invention:

PROCESS FOR PRODUCING ACESULFAME POTASSIUM

Patent Proprietor:

Celanese Sales Germany GmbH

Opponents:

Anhui Jinhe Industrial Co., Ltd.
Suzhou Hope Technology Co., Ltd.
Vitasweet Co., Ltd.

Headword:

Relevant legal provisions:

EPC Art. 54, 56
RPBA Art. 12(4)
RPBA 2020 Art. 13(2), 25(3)

Keyword:

Novelty

Inventive step

Late-filed evidence

Late-filed objection

Late-filed facts

Decisions cited:

Catchword:



Beschwerdekammern

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Case Number: T 2772/19 - 3.3.02

D E C I S I O N
of Technical Board of Appeal 3.3.02
of 17 May 2021

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Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 16 September**

2019 revoking European patent No. 2861569
pursuant to Article 101(3)(b) EPC.

Composition of the Board:

Chairman	M. O. Müller
Members:	S. Bertrand
	R. Romandini

Summary of Facts and Submissions

- I. The appeal lodged by the patent proprietor lies from the decision of the opposition division to revoke European patent No. 2 861 569.
- II. The patent as granted contained 15 claims, independent claim 1 of which read as follows:

"1. A process for producing acesulfame potassium, the process comprising the steps of:

(a) reacting a first reaction mixture comprising:

sulfamic acid,

an amine, and from 1 wppm to 1 wt% acetic acid to form an amidosulfamic acid salt;

(b) reacting the amidosulfamic acid salt with diketene to form an acetoacetamide salt;

(c) deriving the acesulfame potassium from the acetoacetamide salt; wherein a molar ratio of acetic acid to sulfamic acid in the first reaction mixture is less than 0.095:1."

- III. The following documents are referred to in the decision:

D1	DE 34 10 439 A1
D2	X. Duan et al., Synthesis of Acesulfame Potassium, Fine Chemicals 1996, 13, 22-24
D2a	Translation of D2
D5	EP 0 215 347 A1
D6	Linkies, A. et al, Synthesis 1990, 405-406

D7 DE 35 31 358 A1
D8 DE 35 31 357 A1
D9 DE 35 27 070 A1
D10 WO 93/19055 A1
D11 Lu Guanggui's experimental report
A001 Affidavit of Dr Christoph Mollenkopf
A002 Report on experimental data dated 12 December 2019
(patentee)
A003 Experimental Report of Opponent 03 dated May 8, 2020
reworking the experiments of A001
A004 Experimental Report of Opponent 01 dated May 7, 2020
reworking the experiments of A002
A005 Wikipedia entry for "Tropfen" dated May 2, 2012
A006 Manual "NANOCOLOR PC Software for
Spectrophotometers, Version 4.0 Rev. 13 (October
2010), Instruction for Color Measurement
A007 Laboratory Report from Chinese infringement
proceedings relating to CN 104 411 693 B

IV. The opposition division came to, *inter alia*, the following conclusions:

- claim 13 according to the main request (patent as granted) and the corresponding claim of auxiliary request 1-3 did not fulfil the requirements of Article 83 EPC
- the subject-matter of claim 1 of auxiliary request 4 was novel in view of D2/D2a
- the subject-matter of claim 10 of auxiliary request 4 was not novel in view of each of D1, D3 and D4

- the subject-matter of the claims according to auxiliary request 5 was novel pursuant to Article 54 EPC
- the subject-matter of the claims according to auxiliary request 5 did not involve an inventive step in view of D2/D2a as the closest prior art (Article 56 EPC)

- V. In its statement setting out the grounds of appeal, the patent proprietor ("appellant") contested the reasoning of the opposition division and submitted auxiliary requests 6 to 10. It submitted documents A001 and A002. It requested that the appeal proceedings be accelerated.
- VI. Opponent 1 ("respondent 1") and opponent 3 ("respondent 3") are represented by the same patent attorneys. In their replies to the grounds of appeal, counter-arguments regarding added subject-matter, sufficiency of disclosure, novelty (in view of D1 to D6 and D8 to D10) and inventive step (based on any of D1, D2, D5 to D10 as the closest prior art) were provided. They submitted documents A003 to A006.
- VII. Opponent 2 did not submit any reply to the grounds of appeal and was a party as of right to these proceedings.
- VIII. On 16 December 2020, the board issued a communication in preparation for the oral proceedings to be scheduled as requested by the parties and informed the parties that the appellant's request for acceleration of the proceedings had been granted.
- IX. In further letters, respondents 1 and 3 submitted further arguments regarding novelty, inventive step and sufficiency of disclosure. They submitted document

A007. They also commented on the admittance of the attack of lack of inventive step based on D10 as the closest prior art and documents A004, A005, A006 and A007.

- X. In a further letter, the appellant requested that the attack based on D10 as the closest prior art, the part of A004 dealing with the yellowing index, A005, A006 and A007 not be admitted. It submitted further arguments on sufficiency of disclosure, novelty and inventive step.
- XI. Oral proceedings before the board were held on 17 May 2021 in the absence of opponent 2, in accordance with Rule 115(2) EPC and Article 15(3) RPBA. During oral proceedings, the appellant withdrew auxiliary requests 1 to 8. It submitted auxiliary requests 10 and 12 and stated that previous auxiliary request 10 was renamed auxiliary request 11. Respondents 1 and 3 withdrew A007.
- XII. The appellant's case, where relevant to the present decision, may be summarised as follows.

Main request

- Novelty - claim 1
 - As submitted by the opposition division, there was no indication in D2/D2a on the possible meaning of the term "trace". This term did not correspond to an amount of acetic acid ranging from 1 wppm to 1 wt.%, as required by claim 1 of the main request.
 - Diluting glacial acetic acid in a solvent and adding an amount of acetic acid lower than 1 wppm was part of common general knowledge. It was also

possible to wet the three-necked flask used in the process disclosed in D2/D2a with glacial acetic acid before adding the solvent and the reactants to arrive at an amount of acetic acid lower than 1 wppm. The range of from 1 wppm to 1 wt.%, as required by claim 1 of the main request, was not directly and unambiguously disclosed in D2/D2a.

Auxiliary request 9

- Novelty
 - D2/D2a did not disclose an amount of acetic acid between 100 wppm and 1 wt.%, as required by claim 1 of auxiliary request 9.
 - There existed different forms of three-necked flasks, including three-necked flasks adapted to the use of a micropipette. D2/D2a did not exclude the use of a micropipette for adding glacial acetic acid and did not directly and unambiguously disclose a range of acetic acid falling within the range 1 wppm to 1 wt.%, as required by claim 1 of auxiliary request 9.
- Inventive step
 - Considering example 11 of D1 as the closest prior art, the distinguishing features were the amount of acetic acid and the molar ratio of acetic acid to sulfamic acid.
 - A001 showed that low yellowing indexes were obtained with a process according to claim 1 of auxiliary request 9.

- A002 showed that the yellowing index was maintained when the amount of acetic acid was reduced. The effects linked to the distinguishing features were an acceptable yellowing index and the use of less acetic acid.
- The objective technical problem was the provision of a process for preparing acesulfame potassium at less cost while maintaining the yellowing index.
- There was no incentive in any of D1 and D5 to D9 to change the amount of acetic acid to solve the objective technical problem.
- The subject-matter of claim 9 was inventive in view of D1.

Auxiliary requests 10 to 12

- Inventive step
 - The reasons given for claim 1 of auxiliary request 9 applied to claim 1 of each of auxiliary requests 10 to 12.

XIII. Respondents 1 and 3's case, where relevant to the present decision, may be summarised as follows.

Main request

- Claim 1 lacked novelty in view of D2/D2a. D2/D2a disclosed a process for preparing acesulfame potassium comprising all the steps required by claim 1 of the main request and implying the addition of a "*trace of glacial acetic acid*".
- The theoretical minimal amount corresponding to a "*trace of glacial acetic acid*" could only be a

drop added with a pipette. The corresponding amount fell within the range of claim 1 of the main request. Even if it was added with a micropipette, the lowest amount of glacial acetic acid corresponded to more than 10 wppm, as evidenced by A004.

Auxiliary request 9

- Novelty - claim 1
 - The subject-matter of claim 1 of auxiliary request 9 was not novel in view of D2/D2a.
 - The practical lower amount of acetic acid added in the process disclosed in D2/D2a could only be a drop since a micropipette could not be entered in the three-necked flask used in the process of D2/D2a.
- Inventive step - claim 1
 - Considering example 11 of D1 as the closest prior art, the distinguishing features were the amount of acetic acid and the molar ratio of acetic acid to sulfamic acid.
 - D11 referred to the yellowing index of acesulfame potassium and was the only document relevant for assessing the technical effect achieved by the distinguishing features; A002 submitted by the appellant only related to the intermediate and not the final product (acesulfame potassium).
 - D11 showed that the higher the amount of acetic acid, the better the yellowing index of acesulfame potassium was. For this reason, the yellowing index was not maintained when the

amount of acetic acid was reduced, and there was no effect linked to the distinguishing features.

- The objective technical problem was the provision of a process for preparing acesulfame potassium.
- It would have been obvious to the skilled person to reduce the amount of acetic acid in view of D1, which taught that it was possible to add any amount from 0 wt.% to 2.8 wt.% of acetic acid.
- The subject-matter of claim 1 of auxiliary request 9 did not involve an inventive step in view of D1 as the closest prior art.

Auxiliary requests 10 to 12

- The further features of claim 1 of each of auxiliary requests 10 to 12 were either disclosed in D1 (and thus were not distinguishing features) or did not change the discussion of inventive step since they were not associated to any additional technical effect.
- The subject-matter of claim 1 of each of auxiliary requests 10 to 12 did not involve an inventive step in view of D1 as the closest prior art for the same reasons as those given for claim 1 of auxiliary request 9.

Admittance of the submissions filed with the letter of 16 April 2021 as regards D5 (point 56 of the letter) and the criticism of D11 (points 45-49 of the letter)

- There were no exceptional circumstances under Article 13(2) RPBA 2020 justifying the amendment of the appellant's case, raised for the first time prior to the oral proceedings before the board and

regarding the technical effect achieved by the distinguishing feature or the data provided by D11.

- Admitting the criticism of D11 would lead to an entirely fresh case regarding the technical data.

XIV. The appellant requested that:

- the decision under appeal be set aside and that the opposition be rejected
- or, alternatively, that the patent be maintained in amended form on the basis of one of the claim sets of auxiliary request 9 filed with the grounds of appeal, auxiliary request 10 filed during the oral proceedings before the board, auxiliary request 11 filed with the grounds of appeal as auxiliary request 10 and auxiliary request 12 filed during the oral proceedings before the board.
- auxiliary requests 6 to 10 be admitted into the proceedings
- A001 be admitted into the proceedings
- the attack based on D10 as the closest prior art not be admitted into the proceedings
- the part of A004 dealing with the yellowing index and documents A005, A006 and A007 not be admitted into the proceedings

XV. Respondents 1 and 3 had the same requests. They requested that:

- the appeal be dismissed, thus confirming the opposition division's decision to revoke the patent in its entirety

- auxiliary requests 6 to 9 (later withdrawn during oral proceedings) and 10 (made into auxiliary request 11 during oral proceedings) not be admitted into the proceedings
- A001 and A002 not be admitted into the proceedings
- documents A003, A004 and A007 be admitted into the proceedings
- the submissions made by the appellant in the last letter of 16 April 2021 concerning the experimental data as regards D5 (point 56 of this letter) and the criticisms against the experimental data of D11 (points 45-49 of this letter) not be admitted into the proceedings

Reasons for the Decision

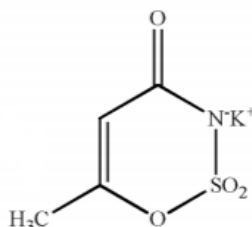
Main request (patent as granted)

1. Novelty - claim 1

1.1 Claim 1 (II, *supra*) relates to a process for producing acesulfame potassium that comprises the three following steps:

- (a) reacting sulfamic acid, an amine and from 1 wppm to 1 wt% acetic acid to form an amidosulfamic acid salt, the molar ratio of acetic acid to sulfamic acid being less than 0.095:1
- (b) reacting the amidosulfamic acid salt with diketene to form an acetoacetamide salt
- (c) deriving acesulfame potassium

This process thus involves the preparation of acesulfame potassium, which has the following chemical structure:



This compound being referred to in the following as "acesulfame K".

- 1.2 Respondents 1 and 3 have contested the novelty of the subject-matter of claim 1 in view of D2/D2a.
- 1.3 D2/D2a discloses the synthesis of acesulfame K. In a first step, triethylamine (53 g) is added dropwise to a solution comprising 48.5 g of aminosulfonic acid (sulfamic acid) in methylene chloride followed by adding a trace of glacial acetic acid (D2a, page 22, right column, paragraphs 2.1 and 2.3.1). This first step corresponds to step (a) according to claim 1 of the main request. The reaction mixture is then treated with diketene to give the corresponding acetoacetamide salt. This further step corresponds to step (b) according to claim 1 of the main request. The final step in D2/D2a is the formation of an intermediate acesulfame H which is converted to acesulfame K after neutralisation with a solution of potassium hydroxide, thus corresponding to step (c) according to claim 1 of the main request. The reaction is summarised on the scheme bridging pages 22 and 23 of D2/D2a.

D2/D2a does not explicitly refer to the formation of an amidosulfamic acid salt in the first step. However, since triethylamine is added to a solution of sulfamic

acid, the formation of an amidosulfamic acid salt is implicit.

In that first step of D2/D2a, reference is made to a "*trace of glacial acetic acid*" (paragraph 2.1). However, from this reference, there is no direct and unambiguous disclosure of the amount of acetic acid.

It was therefore a matter of dispute between the parties whether the claimed amount of acetic acid was anticipated by D2/D2a. Thus, what the lowest possible amount implied by the teaching of D2 is and whether this lowest amount is above the lower limit of the claimed range (1 wppm) had to be examined, *inter alia*.

- 1.4 Respondents 1 and 3 submitted that the practically possible lowest amount could only be a drop of glacial acetic acid applied with a normal pipette and that the amount of acetic acid in such a drop was above the lower limit of 1 wppm required by claim 1, as evidenced by A004. The respondent acknowledged that micropipettes also existed that allowed, in theory, applying smaller amounts. However, a micropipette could not be entered in a three-necked flask, the container used in D2/D2a for the preparation of acesulfame K.

The board does not agree. As submitted by the appellant, there are different forms of three-necked flasks and three-necked flasks adapted to the use of a micropipette. Thus, since D2/D2a leaves it open which type of three-necked flask is applied, the use of a micropipette is not excluded in the process disclosed in D2/D2a. Therefore, a drop of glacial acetic acid applied by a normal pipette is not the lowest possible amount corresponding to the meaning of a "*trace of glacial acetic acid*" in the process of D2/D2a.

1.5 However, even though the board does thus not find the respondents' argument (point 1.4 above) convincing, it nevertheless comes to a conclusion in favour of the respondents.

The minimal volume that can be added by a micropipette is about 1 µl as submitted by respondents 1 and 3 in their reply to the grounds of appeal (page 30, last paragraph of point a)). Such a volume corresponds to more than 10 wppm, as evidenced by A004.

A004 is a reproduction of the synthesis of D2/D2a. It is stated in A004 in the last paragraph of page 1 that 0.967 µl of glacial acetic acid corresponds to 10 wppm of glacial acetic acid in the reaction mixture disclosed in D2/D2a. Hence, 1 µl of glacial acetic acid corresponds to more than 10 wppm of glacial acetic acid. This was not disputed by the appellant.

Hence, the lowest possible amount implied by the teaching of D2/D2a is more than 10 wppm, which is above the lower limit of the claimed range.

1.6 It was not disputed that the term "*trace of glacial acetic acid*" as disclosed in D2/D2a was an amount below the upper limit of the claimed range, i.e. 1 wt.%.

1.7 Therefore, the term "*trace of glacial acetic acid*" implies an amount between more than 10 wppm and less than 1 wt.% of acetic acid. This amount falls within the range of 1 wppm to 1 wt.% as referred to in claim 1 of the main request.

1.8 The appellant referred to the opposition division's reasoning that "*...no indication is provided in D2a on the possible meaning of the term 'trace', let alone within the specific experimental conditions of paragraph 2.3 of D2a. Thus it could - at best - be said*

the process described in D2a may probably fall or even highly likely fall within the scope of claim 1 of the opposed patent". The board takes the view that this reasoning is not sufficient to acknowledge novelty. Even if there is no clear definition of the word "trace" in D2/D2a, the question to be answered is whether the term "*trace of glacial acetic acid*" would correspond to an amount of acetic acid as defined in claim 1 of the main request. As set out above, the term "*trace of glacial acetic acid*" corresponds to an amount of acetic acid between more than 10 wppm and less than 1 wt.%. Thus, the amount is as required by claim 1 of the main request.

The appellant furthermore argued that it was common general knowledge that it was possible to dilute glacial acetic acid in a solvent. It was thus possible to add an amount of acetic acid lower than 1 wppm in the process disclosed in D2/D2a. The board does not see such a disclosure in D2/D2a. D2/D2a refers to "*adding a trace of glacial acetic acid*". Thus, there is in D2/D2a no reference to a dilution of glacial acetic acid. On the contrary, D2/D2a refers to **glacial** acetic acid which is a concentrated rather than a diluted liquid.

Lastly, according to the appellant, it was also possible to wet the three-necked flask used in the process disclosed in D2/D2a with glacial acetic before adding the solvent and the reactants. Thus, with this technique of wetting, it was possible to arrive at an amount of acetic acid lower than 1 wppm. However, there is no such a disclosure in D2/D2a. In fact, this document again discloses the opposite of what the appellant alleges. More specifically, this document discloses in a first step that triethylamine is added dropwise to a solution of aminosulfonic acid in dichloromethane. In a second step, it discloses the

addition of glacial acetic acid. Therefore, there is in D2/D2a no disclosure of an initial step of adding glacial acetic acid (e.g. by wetting the flask) before adding the solvent and the reactants.

Therefore, the appellant's arguments must fail.

1.9 The claimed molar ratio of acetic acid to sulfamic acid is not explicitly disclosed in D2/D2a. However, with the amount of acetic acid being between 10 wppm and 1 wt% (see above), the molar ratio of acetic acid to sulfamic acid in the first step of the process disclosed in D2/D2a can be calculated as follows:

- 0.5 mol of sulfamic acid is used in D2/D2a
- 10 wppm glacial acetic acid corresponds to 1.69×10^{-5} mol, in accordance with respondents 1 and 3's submissions (page 31 of the reply to the grounds of appeal)
- 1 wt.% glacial acetic acid corresponds to 0.0169 mol
- the molar ratio of acetic acid to sulfamic acid is thus from more than 0.000034: 1 ($0.0000169:0.5$, considering an amount of more than 10 wppm acetic acid) to less than 0.034 ($0.0169: 0.5$, considering an amount of less than 1 wt.% of acetic acid)

Hence, the molar ratio of acetic acid to sulfamic acid disclosed in D2 falls within the range of claim 1 of the main request (less than 0.095:1).

1.10 For these reasons, the board comes to the conclusion that the disclosure of D2/D2a anticipates the subject-matter of claim 1 of the main request.

1.11 Therefore, the main request is not allowable.

Auxiliary request 9 filed with the statement of grounds of appeal (claims 1-8)

2. Claim 1 of auxiliary request 9 differs from claim 1 of the main request in that the lower limit of acetic acid was changed to 100 wppm (1 wppm in claim 1 of the main request).

3. Novelty - claim 1

3.1 Respondents 1 and 3 objected to the novelty of the subject-matter of claim 1 of auxiliary request 9 in view of D2/D2a.

3.2 As set out above in the context of claim 1 of the main request, the amount of glacial acetic acid implied by D2/D2a lies within the range of more than 10 wppm and less than 1 wt.%. There is no information in D2/D2a on whether the actual amount implied by this document is below or above 100 wppm. Thus, since D2/D2a does not directly and unambiguously disclose an amount of 100 wppm to 1 wt.% of acetic acid as required by claim 1 of auxiliary request 9, the subject-matter of this claim is novel.

4. Inventive step - claim 1

4.1 Respondents 1 and 3 objected to the inventive step of the subject-matter of claim 1 in view of D1 as the closest prior art.

4.2 Closest prior art

During oral proceedings, the parties agreed that D1 was a suitable starting point for the evaluation of inventive step.

The board sees no reason to deviate from the selection of D1 as the closest prior art.

4.3 Distinguishing features

In example 11 of D1, sulfamic acid ("Amidosulfonsäure", 0.2 mol) is mixed with diketene and 0.02 mole of glacial acetic acid, corresponding to an amount of 2.8 wt.%. To this mixture, triethylamine is added. As not disputed by the parties, the resulting acetoacetamide salt is reacted with SO₃ and neutralised with potassium hydroxide (example 3 on page 33 of D1). It was also not disputed that example 11 of D1 corresponds to a process comprising steps (a) to (c) according to claim 1 of auxiliary request 9, apart from the amount of acetic acid and the molar ratio of acetic acid to sulfamic acid.

The amount of acetic acid in example 11 of D1 (2.8 wt. %) is higher than the amount required by claim 1 of auxiliary request 9 (100 wppm to 1 wt.%), and the molar ratio of acetic acid to sulfamic acid in example 11 of D1 (0.02:0.2, i.e. 0.1:1) is higher than the molar ratio required by claim 1 of auxiliary request 9 (less than 0.095:1).

Therefore, the subject-matter of claim 1 of auxiliary request 9 differs from D1 on account of the content of acetic acid and the molar ratio of acetic acid to sulfamic acid.

4.4 Formulation of the technical problem

4.4.1 For assessing the technical effect in view of example 11 of D1, the appellant referred to the data of A001 and A002. It formulated the objective technical problem as the provision of a process for preparing acesulfame K at less cost while maintaining the yellowing index at the same low level as in D1.

The board does not agree.

A001 is only an experiment of a process of preparation of acesulfame K implying the use of 0.96 wt.% of acetic acid, i.e. a process according to claim 1 of auxiliary request 9. The yellowing index of the resulting acesulfame K is given (4.40, 4.83 and 2.79). However, A001 comprises no comparative data reflecting the teaching of D1, and no effect having its origin in the distinguishing features of claim 1 of auxiliary request 9 is evidenced by the data of A001.

A002 shows the yellowing index of the acetoacetamide salt formed during step b) of claim 1 of auxiliary request 9 when the amount of acetic acid is varied from 0 to 10,000 wppm.

However, A002 relates to the yellowing index of the intermediate product of acesulfame K and not of the final product, which is acesulfame K. Hence, A002 is not relevant for inventive step of the subject-matter of claim 1, which refers to the final rather than the intermediate product.

4.4.2 Only the experimental data D11 submitted by the respondents is relevant for the yellowing index of the final product (acesulfame K). Tables 2 and 3 of D11 show that the yellowing index of acesulfame K obtained by a process implying the use of 2.0 wt.% acetic acid

(10.03 or 10.75, experiment 3 in the tables, above the claimed upper limit of 1 wt.%) is lower than that of acesulfame K obtained with 1.05 wt.% acetic acid (12.14 or 11.45, experiment 2, still above the claimed upper limit) and much lower than that of acesulfame K obtained with 0.95 wt.% acetic acid (13.84 or 11.68, experiment 1), 0.95 wt.% being according to claim 1 of auxiliary request 9. It thus follows from these experimental results that the higher the amount of acetic acid, the lower the yellowing index is. This was not disputed by the appellant.

The acesulfame K obtained in example 11 of D1 by using an amount as high as 2.8 wt.% of acetic acid must thus have a yellowing index lower than that obtained with an amount of acetic acid as claimed, i.e. at most 1 wt.%. Hence, the amount of acetic acid as defined in claim 1 does not lead to the maintenance of a low yellowing index. Therefore, this part of the problem formulated by the appellant does not belong to the objective technical problem.

The only effect achieved by the distinguishing features of claim 1 of auxiliary request 9 is the need for a lower amount of acetic acid when compared to the process of example 11 of D1.

Consequently, the objective technical problem is only the provision of a process of preparing acesulfame K at less cost.

4.5 Obviousness of the solution

As set out above, D1 teaches, *inter alia*, to prepare acesulfame K in the presence of 2.8 wt.% acetic acid (example 3 of D1). It would have been obvious to the skilled person to reduce the content of acetic acid

acid to reduce the cost. This was not disputed by the appellant.

Furthermore, by reducing the content of acetic acid to a content of 100 wppm to 1 wt.% (i.e. from 0.00007 to 0.007 mol) in the process disclosed in example 11 of D1, the molar ratio of acetic acid (0.00007 to 0.007) to sulfamic acid (0.2 mol as set out above) would automatically fall within the range required by claim 1 of auxiliary request 9. This was also not disputed by the appellant.

Hence, the skilled person would have arrived at the subject-matter of claim 1 of auxiliary request 9 without inventive skill.

4.6 Therefore, the subject-matter of claim 1 of auxiliary request 9 does not involve an inventive step.

5. For this reason, auxiliary request 9 is not allowable.

Auxiliary request 10

6. Claim 1 of auxiliary request 10 differs from claim 1 of auxiliary request 9 in that the lower limit of acetic acid was changed to 900 wppm (100 wppm in claim 1 of auxiliary request 9).

7. Inventive step - claim 1

The further limitation of the acetic acid content does not achieve any additional technical effect in view of D1. Thus, the reasons given for claim 1 of auxiliary request 9 apply, *mutatis mutandis*, to claim 1 of auxiliary request 10.

The subject-matter of claim 1 of auxiliary request 10 therefore does not involve an inventive step.

8. Thus, auxiliary request 10 is not allowable.

Auxiliary request 11

9. Claim 1 of auxiliary request 11 differs from claim 1 of auxiliary request 9 in that the molar ratio of amine to sulfamic acid in the first reaction mixture is less than 1.06:1 (not specified in claim 1 of auxiliary request 9).

10. Inventive step - claim 1

The additional feature of claim 1 of auxiliary request 11 is disclosed in example 11 of D1. In this example, the process uses 0.2 mol of sulfamic acid and 0.21 mol of triethylamine. This means that the molar ratio of amine to sulfamic acid in the first reaction mixture is 1.05, i.e. less than 1.06:1 as required by claim 1 of auxiliary request 11.

Consequently, there is no additional distinguishing feature present. Thus, the reasons given for claim 1 of auxiliary request 9 also apply to claim 1 of auxiliary request 11.

The subject-matter of claim 1 of auxiliary request 11 therefore does not involve an inventive step.

11. For this reason, auxiliary request 11 is not allowable.

Auxiliary request 12

12. Claim 1 of auxiliary request 12 differs from claim 1 of auxiliary request 11 in that the lower limit of acetic acid was changed to 900 wppm (100 wppm in claim 1 of auxiliary request 11). Claim 1 thus corresponds to a combination of each claim 1 of auxiliary requests 10 and 11.

13. Inventive step - claim 1

Since claim 1 of auxiliary request 12 is a combination of claim 1 of auxiliary requests 10 and 11, and since no argument was made that the combination of these features provides any inventive contribution, the reasons given for claim 1 of auxiliary requests 10 and 11 apply to claim 1 of auxiliary request 12.

Therefore, the subject-matter of claim 1 of auxiliary request 12 does not involve an inventive step.

14. Hence, auxiliary request 12 is not allowable.

15. Admittance

15.1 Auxiliary requests 9 to 12

During the oral proceedings, it was found that auxiliary requests 9 to 12 were not allowable. Thus, no decision was needed as regards their admittance.

15.2 Admittance of A001 and A002

Respondents 1 and 3 requested that A001 and A002 not be admitted into the proceedings.

A001 and A002 were used by the appellant in support for arguing that an inventive step was present. During the oral proceedings, the board decided to admit A001 and A002 into the proceedings pursuant to Article 12(4) RPBA 2007. However, when taking into account A001 and A002, auxiliary request 9 to 12 were still found to lack inventive step (see above). Thus, a detailed reasoning for the admittance of A001 and A002 does not need to be given.

- 15.3 Admittance of the objection of lack of plausibility, A006 and the attack of lack of inventive step based on D10 as closest prior art

The objection of lack of plausibility, A006 and the attack based on D10 as the closest prior art were all submitted by respondents 1 and 3 in the framework of inventive step of the auxiliary requests.

Since, in the respondents' favour and without taking any of the above submissions into account, the subject-matter of claim 1 of any of auxiliary requests 9 to 12 was found not to involve an inventive step, no decision was needed on the admittance of any of these submissions.

- 15.4 Admittance of samples 9 and 10 of A004

During oral proceedings, the board decided not to admit samples 9 and 10 of A004 submitted by respondents 1 and 3 into the proceedings. Samples 9 and 10 of A004 were relied on by the respondents for supporting the lack of inventive step.

In view of the lack of inventive step of claim 1 of auxiliary request 9 to 12, even without considering samples 9 and 10 of A004, a detailed reasoning for their non-admittance does not need to be given.

- 15.5 Admittance of the appellant's submissions filed on 16 April 2021 as regards D5 (point 56 of the letter)

- 15.5.1 In its letter of 16 April 2021 (point 56 of the letter), the appellant submitted comparative data in view of the teaching of D5. The yellowing index (3.3) of the intermediate acetoacetamide salt prepared according to D5 was compared to the yellowing index (2.9) of a second intermediate acetoacetamide salt

prepared according to the invention. The comparison concerned the question whether the amount of acetic acid led to a technical effect.

15.5.2 The respondents requested that these submissions not be admitted into the proceedings.

15.5.3 These submissions were made for the first time one month before the oral proceedings and thus represent an amendment to the appellant's case made after notification of the summons to oral proceedings.

The admittance of the submissions is thus governed by Article 13(2) RPBA, which applies to the case at hand in accordance with the transitional provisions set out in Article 25(3) RPBA 2020 (the summons to oral proceedings was notified after 1 January 2020).

The board notes that the absence of a technical effect had already been pointed out in the impugned decision (point 5.1, in particular page 15), and the objective technical problem was formulated as the provision of an alternative. Thus, whether the amount of acetic acid led to a technical effect had already been raised in the impugned decision. The technical data submitted with the letter of 16 April 2021 should therefore have been submitted with the statement of grounds of appeal or, at the latest, after the reply to the grounds of appeal in which the respondents challenged the presence of a technical effect achieved by the distinguishing feature (top of page 53 of the reply to the grounds of appeal). There are therefore no reasons, and the appellant did not provide any, that could be regarded as exceptional circumstances within the meaning of Article 13(2) RPBA 2020 justifying the filing of the appellant's submissions at such a late stage of the proceedings.

For these reasons, in exercising its discretion under Article 13(2) RPBA 2020, the board decided not to admit the appellant's submissions filed on 16 April 2021 as regards D5 (point 56 of the letter) into the proceedings.

15.5.4 Incidentally, the appellant's submissions are not relevant to the above conclusion on lack of inventive step of the subject-matter of claim 1 of the auxiliary requests since claim 1 concerns the final product while the appellant's submission refers to effects linked to an intermediate rather than the final product.

15.6 Admittance of the appellant's submissions filed on 16 April 2021 as regards its criticism of D11 (points 45-49 of the letter)

In the letter of 16 April 2021 (points 45-49 of the letter), submissions were also made on the relevance of D11. This document was filed by the respondents and describes a repetition of example 2 of the patent and repetitions of this example with different amounts of acetic acid falling within or outside the claimed range. By comparing the results obtained in view of the amount of acetic acid falling within or outside the claimed range, the respondents concluded that the claimed amount of acetic acid did not lead to any effect. In its letter of 16 April 2021, the appellant contested this conclusion by arguing that the conditions between the experiments made in D11 and example 2 of the patent regarding the amine used, the pH conditions, the order of addition of the reactants and the solvent evaporation conditions were different. The results of D11 obtained in view of the amount of acetic acid within or outside the claimed range were thus not truly comparative and had to be disregarded.

15.6.1 The respondents requested that these submissions not be admitted into the proceedings.

15.6.2 These submissions were made for the first time one month before the oral proceedings and thus represent an amendment to the appellant's case made after notification of the summons to oral proceedings.

The admittance of the submissions is thus governed by Article 13 (2) RPBA 2020 (15.4.3, *supra*).

15.6.3 D11 had been submitted before the opposition division and was already relied on by the respondents in their reply to the grounds of appeal. The criticism about the data in D11 could and should therefore have been submitted after the reply to the grounds of appeal. No reasons were given why the criticism could not be submitted at an earlier stage of the proceedings. There are, therefore, no reasons that could be regarded as exceptional circumstances within the meaning of Article 13(2) RPBA 2020 justifying the filing of these submissions at such a late stage of the proceedings.

Furthermore, admitting the criticism about D11 would have led to a new evaluation of the technical data on the yellowing index of acesulfame K contained in D11. As submitted by the respondents, it would have been necessary to discuss and evaluate the differences between the process used in D11 and the process of example 2 of the patent and why these differences gave different results in tables 2 and 3 of D11 versus example 2 of the patent. Therefore, the admittance of the criticism would have led to an entirely fresh case, regarding the technical data, to be considered for the first time at a very late stage at the appeal proceedings, contrary to the requirements of Article 12(2) RPBA 2020.

15.6.4 For these reasons, the board decided not to admit the submissions filed on 16 April 2021 as regards the criticism of D11 (points 45-49 of the letter) into the proceedings.

Order

For these reasons it is decided that:

1. The appeal is dismissed.

The Registrar:

The Chairman:



N. Maslin

M. O. Müller

Decision electronically authenticated