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**Datasheet for the decision  
of 19 October 2022**

**Case Number:** T 0623/20 - 3.3.05

**Application Number:** 09834841.0

**Publication Number:** 2368849

**IPC:** C01B39/48, B01J39/14,  
B01J20/18, B01J29/70,  
B01D53/02, B01J20/28

**Language of the proceedings:** EN

**Title of invention:**

CHABAZITE-TYPE ZEOLITE AND PROCESS FOR PRODUCING THE SAME

**Patent Proprietor:**

Tosoh Corporation

**Opponents:**

Clariant Produkte (Deutschland) GmbH  
Süd Chemie India Pvt Ltd

**Headword:**

Chabazite zeolite/Tosoh

**Relevant legal provisions:**

EPC Art. 100(b), 113(1)  
RPBA 2020 Art. 12(6), 11

**Keyword:**

Grounds for opposition - sufficiency of disclosure (yes)  
Late-filed evidence - should have been submitted in first-  
instance proceedings (yes)

**Decisions cited:**

T 0256/87, T 0608/07, T 1610/08, T 0593/09, T 0544/12,  
T 2290/12, T 0061/14

**Catchword:**



**Beschwerdekammern**

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Case Number: T 0623/20 - 3.3.05

**D E C I S I O N**  
**of Technical Board of Appeal 3.3.05**  
**of 19 October 2022**

**Appellant:**

(Patent Proprietor)

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(Opponent 2)

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**Decision under appeal:**

**Decision of the Opposition Division of the  
European Patent Office posted on 23 January 2020  
revoking European patent No. 2368849 pursuant to  
Article 101(3) (b) EPC.**

**Composition of the Board:**

**Chairman**            G. Glod  
**Members:**            S. Besselmann  
                              S. Fernández de Córdoba

## Summary of Facts and Submissions

- I. The appeal in this case is against the opposition division's decision to revoke the European patent EP 2 368 849 B1. The patent in suit concerns a chabazite-type zeolite and a process for producing the same.
- II. The opposition division found that the invention was insufficiently disclosed.
- III. The two claims of the patent as granted relate to a chabazite-type zeolite and to a process for producing the same and they read as follows:

"1. A chabazite-type zeolite **characterized by** having an  $\text{SiO}_2/\text{Al}_2\text{O}_3$  molar ratio of 15-50 and an average crystal particle diameter of 1.5  $\mu\text{m}$  or more, wherein the average crystal particle diameter is measured by scanning electron microscope (SEM) by arbitrarily selecting 50 crystal particle images from one or more SEM photographs taken at 5,000-fold magnifications, measuring the 50 crystal particle diameters thereof, and calculating a weighted average thereof."

"2. A process for producing the chabazite-type zeolite as claimed in claim 1, **characterized in that** a starting-material composition in which the molar ratio of  $\text{SiO}_2$  to  $\text{Al}_2\text{O}_3$ , and the molar ratios of a structure-directing agent, OH and water to  $\text{SiO}_2$  satisfy

$$16 \leq \text{SiO}_2/\text{Al}_2\text{O}_3 \leq 100$$

$$0.1 \leq \text{OH}^-/\text{SiO}_2 < 0.9$$

$0.05 \leq (\text{structure-directing agent})/\text{SiO}_2 < 0.13$  and

$$5 \leq \text{H}_2\text{O}/\text{SiO}_2 < 30$$

*is crystallized in the presence of at least one kind of alkali metal ions selected from the group consisting of K, Rb, and Cs, and that the structure-directing agent comprises at least one member selected from the group consisting of N,N,N-trimethyladamantylammonium hydroxide, N,N,N-trimethyladamantylammonium halides, N,N,N-trimethyladamantylammonium carbonate, N,N,N-trimethyladamantylammonium methyl carbonate, and N,N,N-trimethyladamantylammonium sulfate."*

- IV. The following documents cited in the impugned decision are of relevance here:
- E7 US 2003/0069449 A1
  - E27 EP 1 424 128 B1
  - E28 EP 0 227 168 B1
  - E31 Figures 1 and 2 of WO 2010/074040 (international publication of the application from which the patent in suit derived) with annotations
- V. With its grounds of appeal, the patent proprietor (appellant) defended the patent as granted and filed auxiliary requests 1-27.
- VI. Opponent 1 (respondent 1) replied to the appeal and submitted the following documents, among other documents:
- E33 Wikipedia page entitled "Weighted arithmetic mean" of 6 October 2020
  - E34 Brochure "PQ Sodium Silicates", PQ corporation, 2004
  - E35 Experimental report

VII. The appellant's arguments, where relevant to the present decision, can be summarised as follows.

Respondent 1's experimental report E35 was filed late and was to be disregarded.

The reasoning provided in the impugned decision related to Article 84 EPC and could not justify revocation on the ground of Article 100(b) EPC. The patent in suit provided sufficient information to allow the skilled person to obtain a chabazite-type zeolite having the required average crystal particle diameter. The patent explained how it was measured (paragraph [0035]) and contained several examples of how the zeolite could be prepared. The molar ratio of the starting material composition, which was the key information, was provided.

The right to be heard had been violated because the opposition division had changed their chain of reasoning in the written decision compared with the reasons given during the oral proceedings and because the considerations on reworking Example 3 of the patent in suit had not been properly discussed.

The case should be remitted to the opposition division for further prosecution, particularly for the assessment of novelty and inventive step.

VIII. Respondent 1's (opponent 1's) arguments, where relevant to the present decision, can be summarised as follows.

The experimental report E35 was to be admitted into the proceedings because it constituted a legitimate response to the appellant's argument that the way in which the average crystal particle diameter was to be

measured derived from Example 3 of the patent in suit considered in conjunction with Figure 1. No fresh objection was raised because it had already been contested during the opposition proceedings that Example 3 and the amorphous aluminosilicate gel used in it could be obtained. E35 referenced E34, so both documents had to be considered together.

The invention was insufficiently disclosed. The case under consideration was similar to T 61/14. The patent in suit did not instruct the skilled person on how to determine the features in the claim relating to an average crystal particle diameter of 1.5  $\mu\text{m}$ , how to calculate a weighted average and how to arbitrarily select 50 crystal particle images. It was not known how a diameter of the quasi-cubic rhomboedric chabazite crystals could be measured. There were many possible ways of defining the diameter, which all led to different results, as depicted in E31. The fact that the side length had to be chosen did not derive from the patent in suit. There were also no instructions on how the "arbitrary selection" of the crystal particle images had to be carried out to obtain reproducible results, in particular in the case of a heterogeneous particle size distribution. There was no information on how the weighting had to be performed. Paragraph [0035] of the patent in suit was irrelevant because it did not mention weighting; an arithmetic average did not involve weighting, as was clear from E33. These issues not only concerned the scope of protection, but also the essence of the invention. They led to a substantial deviation of 20%-35% or greater, and therefore the measured value was deprived of its technical relevance.

The invention was also insufficiently disclosed because Example 3 of the patent in suit could not be reworked.



It was not known how an amorphous aluminosilicate gel having the required silica/alumina ratio (SAR) could be obtained, as shown in E35. In particular, it was not known which sodium silicate had to be used and what its NaOH content was.

IX. Opponent 2 (respondent 2) did not make any submissions regarding the substantive issues.

X. The appellant (patent proprietor) requested that the decision under appeal be set aside and that the opposition be rejected, corresponding to the main request submitted with the grounds of appeal, and alternatively that the patent be maintained on the basis of one of auxiliary requests 1-27 filed with the grounds of appeal.

Respondent 1 (opponent 1) requested that the appeal be dismissed.

### **Reasons for the Decision**

1. Consideration of documents, Article 12(6) RPBA 2020

1.1 The experimental report E35 was filed by respondent 1 with the reply to appeal. It was intended to demonstrate that it was not possible to reproduce the starting material (amorphous aluminosilicate material (AAM) having a  $\text{SiO}_2:\text{Al}_2\text{O}_3$  molar ratio of 28), prepared in the first stage of Example 3 of the impugned patent.

1.2 However, this experimental report, and E34 referenced in E35, should have been filed before the opposition division. The respondent raised the objection that

Example 3 could not be identically reproduced during opposition proceedings (point 3.1.(iv) of the impugned decision) and they should then also have filed any evidence in support of this objection. According to the established case law of the boards of appeal, each of the parties to the proceedings bears the burden of proof for the facts it alleges (Case Law of the Boards of Appeal of the EPO, 10th edition, 2022, I.C.3.5.1). There is no apparent reason why the evidence was not filed before the opposition division and was only filed at the appeal stage. Therefore, the board cannot recognise that the circumstances of the appeal case would justify the admittance of E34 and E35.

- 1.3 E34 and E35 are therefore not taken into account (Article 12(6) RPBA 2020).
- 1.4 E33 merely reflects common general knowledge which, as such, was not contested.
2. Sufficiency of disclosure, Article 100(b) EPC
  - 2.1 Claim 1 specifies that the chabazite-type zeolite has an average crystal particle diameter of 1.5  $\mu\text{m}$  or more, wherein the average crystal particle diameter is measured by scanning electron microscopy (SEM) by arbitrarily selecting 50 crystal particle images from one or more SEM photographs taken at 5,000-fold magnifications, measuring the 50 crystal particle diameters thereof, and calculating a weighted average thereof.
  - 2.2 A non-spherical crystal particle has no diameter in a strict sense. Instructions are thus missing on how exactly the "diameter" is identified and how the

weighted average is calculated, i.e. how the weighting is performed.

Nevertheless, there is no reason why the skilled person who is familiar with measuring particle sizes of a zeolite using electron microscopy (E7, paragraph [0047]; E27, paragraph [0016] and E28, page 9, point (5)) would be unable to identify a suitable length, for instance the face side length, of a crystal particle, and measure it.

The result depends to some extent on the type of length measured, as illustrated in E31, in which a value of 1.6  $\mu\text{m}$  was obtained for one edge, a value of 1.7  $\mu\text{m}$  for the other edge and a value of 2.05  $\mu\text{m}$  for the diagonal, each of these being the arithmetic mean of four crystals; however, such deviations of the results depending on which length is chosen as the "diameter" concern the question of clarity (Article 84 EPC) and not sufficiency of disclosure (see also T 593/09, point 4.1.4. of the Reasons), especially in the case of an open-ended range for the parameter.

The reference to a *weighted* average without any further indication adds to possible deviations of the results, in that they may depend on the chosen weighting (which might for instance be based on crystal particle area); however, this would not have prevented the skilled person from conducting the measurement. This is even more so as the patent explicitly describes that a particle diameter was obtained by averaging the diameters of the particles (paragraph [0035]), which is understood as calculating the number-based average. There is no reason why this could not be regarded as a number-weighted average in the context of the present patent. The explanations in E33 do not contradict

considering the arithmetic mean to be a special case of a weighted mean (E33 (second paragraph), "if all the weights are equal, then the weighted mean is the same as the arithmetic mean").

2.3 The claim instructs the skilled person to "arbitrarily" select 50 crystal particle images. The skilled person would understand this as performing a random sampling operation, considering that an average value is then to be determined. No reason is apparent as to why the skilled person would be unable to do so, or why this would involve an undue burden. According to the claim, 50 crystal particle images are to be selected. While the result may depend on which specific crystal particle images are chosen, i.e. there may be a margin of error, its extent is not known. There is no proof from the respondents' side that the results of such measurements would consequently be unreliable and unreproducible, as would be the case if, for instance, the margin of error was so large that the result would have no technical significance.

2.4 In light of the above, the issues raised merely concern possible uncertainties linked to determining the average crystal particle diameter, in the sense of a possibly large error margin or a large spread of the results. Respondent 1 estimated the error margin as being 20-35% or even greater. In this case, the existence of a, possibly large, error margin is only relevant near the limits of the claim, when assessing whether an average crystal particle diameter is within the specified open-ended range of 1.5  $\mu\text{m}$  or more, or outside this range. It thus concerns the question of whether the limits of protection conferred by the claim are clear, this being a requirement of Article 84 EPC; however, there is no indication that the ambiguity

would permeate the whole claim (see T 608/07, point 2.5.2 of the Reasons). By contrast, the patent in suit shows that comparative zeolites can have much smaller average crystal particle diameters of 0.18  $\mu\text{m}$  to 0.48  $\mu\text{m}$  (Table 3, Comparative zeolites). In particular, there is no evidence that the possible uncertainties would be such that they would deprive the parameter relating to the average crystal particle diameter of any technical meaning and that, as a consequence of them, the skilled person would be unable to carry out the invention.

- 2.5 This case is not comparable to any of the cases cited by respondent 1. In T 61/14 neither the patent nor the prior art provided information on how to measure the parameter under consideration (points 5.8 and 5.9 of the Reasons), and therefore the underlying issue was not merely the possible uncertainty of the result at the limit of the claim. Neither of T 544/12 and T 1610/08 relates to the possible uncertainty of a parameter at the lower end point. In T 544/12 it was necessary to identify those compounds out of the host of compounds defined by the structural feature(s) in the claim which also fulfilled the claimed functional requirement(s) (point 4.2 of the Reasons). T 1610/08 dealt with the issue of whether a detailed description of at least one way of carrying out the invention was given (point 2, seventh paragraph, of the Reasons).

Furthermore, by contrast with T 256/87 (in which sufficiency was recognised anyway), it was the predominant opinion in later decisions that the definition of a 'forbidden area' of a claim should not be considered as a matter related to Article 83 EPC but rather to Article 84 EPC (see Case Law of the Boards of

Appeal of the EPO, 10th edition, 2022 II.C.6.6.4 or, for example, T 2290/12, point 3.1 of the Reasons).

2.6 Respondent 1 also argued that the skilled person would have been unable to carry out the required zeolite synthesis because they would not know how to obtain an amorphous aluminium silicate gel having the necessary SAR (silica/alumina ratio).

E35 (see point 1.) is not taken into consideration. It has not been demonstrated that the skilled person would be unable to provide a CHA zeolite having the specified SAR. The patent in suit mentions several prior-art documents which describe CHA zeolites having a broad range of  $\text{SiO}_2:\text{Al}_2\text{O}_3$  ratios (paragraphs [0003]-[0005]; Comparative Example 1 reproducing the prior art). Furthermore, preparing an amorphous aluminosilicate gel as a starting material as shown in Example 3 is not the only method exemplified in the patent in suit; see, for instance, Example 2.

Even if the experimental protocols provided in the patent might not include all the necessary details for an identical reproduction, there is no evidence that the skilled person would have been unable to steer the zeolite synthesis towards the desired large average crystal particle diameter, based on the teaching provided in the patent in suit, and to thus obtain a chabazite-type zeolite according to claim 1.

As follows from the considerations regarding the measurement of the average crystal particle diameter set out above (points 2.2 to 2.4), there is also no need to identically reproduce a given example as a reference point to assign a meaning to this parameter.

- 2.7 In conclusion, the requirement of sufficiency of disclosure is met.
- 2.8 The same considerations apply to process claim 2.
3. Alleged violation of the appellant's right to be heard, Article 113(1) EPC
- 3.1 The appellant argued that the opposition division changed its chain of reasoning, in that the reasoning in the written decision differed from the brief summary given by the chairwoman during the oral proceedings.

However, the actual decision given orally did not differ from that given in writing. The minutes of the oral proceedings indicated that a brief summary of the reasons was given by the chairwoman, but do not report this summary (page 5, third line from the bottom). In any case, it is normal practice that the reasoning is communicated in writing. The chairwoman was not obliged to provide any reasoning during the oral proceedings, let alone the full reasoning. A brief summary naturally cannot include all the aspects, and therefore the appellant could not have been surprised that a further aspect, which was allegedly not mentioned in the brief summary but discussed during the oral proceedings, was relied on in the written decision. Furthermore, the fact that one aspect had allegedly been mentioned orally that was not relied on in the decision is to the appellant's favour. In particular, there is no indication that the alleged differences between the brief summary and the written decision had any bearing on the final outcome of the oral proceedings, in that they might have influenced the appellant's line of

defence or procedural choices during the oral proceedings.

- 3.2 The minutes of the oral proceedings before the opposition division demonstrate that all the reasons had been discussed with the parties, including the question of whether Example 3 could be reworked, on which the patent proprietor had an opportunity to comment (see page 2, third paragraph; page 3, penultimate paragraph - page 4, first paragraph; page 4, fifth paragraph of the minutes).
- 3.3 The board therefore sees no violation of the appellant's right to be heard.
4. Remittal, Article 11 RPBA 2020
  - 4.1 The grounds for opposition relating to novelty and inventive step have not yet been dealt with. In view of the primary object of the appeal proceedings to review the decision under appeal in a judicial manner (Article 12(2) RPBA 2020), the circumstances of this case, in which the opposition division has not decided on these grounds for opposition, qualify as a special reason for remittal under Article 11 RPBA 2020. The case is therefore to be remitted to the opposition division for further prosecution (Article 111(1) EPC).



## Order

### For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the opposition division for further prosecution.

The Registrar:

The Chairman:



A. Pinna

G. Glod

Decision electronically authenticated