

**Internal distribution code:**

- (A) [ - ] Publication in OJ  
(B) [ - ] To Chairmen and Members  
(C) [ - ] To Chairmen  
(D) [ X ] No distribution

**Datasheet for the decision  
of 4 December 2019**

**Case Number:** T 1049/17 - 3.3.05  
**Application Number:** 09737470.6  
**Publication Number:** 2340103  
**IPC:** B01D53/94, B01J23/72,  
B01J29/072, B01J29/76  
**Language of the proceedings:** EN

**Title of invention:**

A METHOD OF CONVERTING NITROGEN OXIDES WITH TRANSITION METAL-  
CONTAINING ALUMINOSILICATE ZEOLITE

**Patent Proprietor:**

JOHNSON MATTHEY PUBLIC LIMITED COMPANY

**Opponents:**

PQ Corporation  
BASF Corporation  
Maiwald Patent- und Rechtsanwalts-gesellschaft mbH

**Headword:**

Method of converting NO<sub>x</sub>/JOHNSON MATTHEY

**Relevant legal provisions:**

EPC Art. 54(1), 54(2), 56, 123(2)  
EPC R. 80  
RPBA Art. 12(4), 13(1), 13(3)

**Keyword:**

Admissibility of appeal - (yes)

Amendments - pointer to the claimed selection (no) - main and first auxiliary requests - added subject-matter (yes) - second auxiliary request - added subject-matter (no)

Sufficiency of disclosure - second auxiliary request (yes)

Novelty - second auxiliary request (yes)

Inventive step - second auxiliary request (yes)

**Decisions cited:**

G 0003/14, T 0934/02

**Catchword:**



**Beschwerdekammern**  
**Boards of Appeal**  
**Chambres de recours**

Boards of Appeal of the  
European Patent Office  
Richard-Reitzner-Allee 8  
85540 Haar  
GERMANY  
Tel. +49 (0)89 2399-0  
Fax +49 (0)89 2399-4465

Case Number: T 1049/17 - 3.3.05

**D E C I S I O N**  
**of Technical Board of Appeal 3.3.05**  
**of 4 December 2019**

**Appellant 1:** JOHNSON MATTHEY PUBLIC LIMITED COMPANY  
(Patent Proprietor) 5th Floor  
25 Farringdon Street  
London EC4A 4AB (GB)

**Representative:** Boulton Wade Tennant LLP  
Salisbury Square House  
8 Salisbury Square  
London EC4Y 8AP (GB)

**Respondent 1:** PQ Corporation  
(Opponent 2) P.O. Box 840  
Valley Forge, PA 19482-0840 (US)

**Representative:** Finnegan Europe LLP  
1 London Bridge  
London SE1 9BG (GB)

**Appellant 2:** BASF Corporation  
(Opponent 3) 100 Park Avenue  
Florham Park, NJ 07932 (US)

**Representative:** Altmann Stöbel Dick Patentanwälte PartG mbB  
Isartorplatz 1  
80331 München (DE)

**Respondent 2:** Maiwald Patent- und Rechtsanwaltsgesellschaft  
mbH  
Elisenhof

(Opponent 4)

Elisenstrasse 3  
80335 München (DE)

**Decision under appeal:**      **Interlocutory decision of the Opposition  
Division of the European Patent Office posted on  
19 April 2017 concerning maintenance of the  
European Patent No. 2340103 in amended form.**

**Composition of the Board:**

**Chairman**                    E. Bendl  
**Members:**                    A. Haderlein  
                                      P. Guntz

## Summary of Facts and Submissions

- I. Appeals were filed by appellant 1 (proprietor) and appellant 2 (opponent 3) against the opposition division's interlocutory decision finding that, on the basis of the second auxiliary request, the patent in suit met the requirements of the EPC.
- II. Opponent 1 filed an appeal but subsequently withdrew its appeal and its opposition. It thus ceased to be party to these proceedings.
- III. Opponent 2 filed an appeal which it subsequently withdrew. It is respondent 1.
- IV. Opponent 4 did not file an appeal. It is respondent 2.
- V. The opposition division held *inter alia* that the subject-matter of claim 1 of the second auxiliary request on which its decision was based complied with the requirement of inventive step in view of:
- D2: US 2008/0241060 A1  
D33: EP 0 373 665 A2  
D34: EP 0 462 598 A2 and  
D36: Gusinet, M. and Gilson, J.-P., "Zeolites For Cleaner Technologies", pages 58 to 61.
- VI. The following documents were also cited during the proceedings before the opposition division:
- D3: US 4 544 538 A  
D4: US 2003/0069449 A1  
D6: US 2008/0226545 A1  
D10: Robson, H., ed., "Verified Syntheses of Zeolitic Materials", pages 126 to 127, 2001

D13: WO 2008/106518 A2  
D19: WO 2008/132452 A2  
D22: Zones, S.I. and Van Nordstrand, R.A., Zeolites  
1988, vol. 8, pages 166 to 174  
D30: WO 99/39809 A1 and  
D37: Declaration of Alexander Green, Ph.D. dated  
12 January 2017 and received at the EPO on  
13 January 2017 (labelled "D33").

- VII. With its grounds of appeal, appellant 1 filed a main request and first to third auxiliary requests. With its reply dated 12 January 2018 to appellant 2's grounds of appeal, it filed a fourth auxiliary request.
- VIII. At the oral proceedings, appellant 1 filed *inter alia* an amended second auxiliary request.
- IX. The wording of claim 1 of appellant 1's main request and first and second auxiliary requests, which are the requests relevant for the present decision, is set out below:

Main request

"1. A synthetic aluminosilicate zeolite catalyst containing at least one catalytically active transition metal, which is copper, which aluminosilicate zeolite is a small pore aluminosilicate zeolite having a maximum ring size of eight tetrahedral atoms, which has the Framework Type Code CHA, wherein the mean crystallite size of the aluminosilicate zeolite determined by scanning electron microscope is >0.50 micrometer and <5.0 micrometers, wherein the total at least one transition metal present in the catalyst is from 0.5 to 5.0 wt% based on the total weight of the zeolite catalyst, and wherein the isotype framework

structure of CHA is SSZ-13."

Compared with claim 1 of the main request, in claim 1 of the first auxiliary request the expression "at least" in the first line has been deleted.

Second auxiliary request

"1. A method of converting nitrogen oxides in a gas to nitrogen by contacting the nitrogen oxides with a nitrogenous reducing agent in the presence of a synthetic aluminosilicate zeolite catalyst, the synthetic aluminosilicate zeolite catalyst containing at least one catalytically active transition metal, which is copper, which aluminosilicate zeolite is a small pore aluminosilicate zeolite having a maximum ring size of eight tetrahedral atoms, which has the Framework Type Code CHA, wherein the mean crystallite size of the aluminosilicate zeolite determined by scanning electron microscope is  $>0.50$  micrometer and  $<5.0$  micrometers, wherein the total at least one transition metal present in the catalyst is from 0.5 to 5.0 wt% based on the total weight of the zeolite catalyst, wherein nitrogen monoxide in the gas is oxidised to nitrogen dioxide using an oxidation catalyst located upstream of the zeolite catalyst and the resulting gas is then mixed with nitrogenous reductant before the mixture is fed into the zeolite catalyst, and wherein the oxidation catalyst is adapted to yield a gas stream entering the zeolite catalyst having a ratio of NO to NO<sub>2</sub> of from 4:1 to 1:3 by volume."

Dependent claims 2 to 5 concern particular embodiments of the method according to claim 1.

- X. Appellant 1's arguments, as far as relevant for the present decision, may be summarised as follows:

The subject-matter of all requests complied with the requirement of Article 123(2) EPC. In particular, there was a clear pointer in the application as filed to both the SSZ-13 isotype and the upper limit of the crystallite size. The subject-matter of claim 1 of the second auxiliary request was novel and involved an inventive step. In particular, D33 did not teach increasing the crystallite size in order to increase the catalytic activity in both the aged state and the fresh state.

- XI. Appellant 2's and respondent 1's submissions, as far as relevant for the present decision, may be summarised as follows:

None of appellant 1's claim requests should be admitted into the proceedings. They did not comply with the requirement of Article 123(2) EPC either. In particular, there was no pointer to selecting the SSZ-13 isotype and to the upper limit of the crystallite size. The second auxiliary request did not comply with Rule 80 EPC either because a dependent claim had been added to the independent method claim. The second auxiliary request did not comply with the requirement of sufficiency of disclosure. The subject-matter of its claim 1 was not novel in view of D6, D13 and D19, and did not involve an inventive step when starting from D2, D6, D13, D19 and D4.

- XII. Requests

Appellant 1 requested that the contested decision be set aside and that the patent be maintained in amended



form on the basis of the main request or the first or third auxiliary requests filed with its grounds of appeal, the second auxiliary request filed during the oral proceedings or the fourth auxiliary request filed with its reply dated 12 January 2018.

Appellant 2 requested that the decision under appeal be set aside and that the European patent be revoked.

Respondent 1 requested that appellant 1's appeal be rejected as inadmissible. After withdrawing its own appeal, it implicitly requested that, in the alternative, the appeal be dismissed.

## **Reasons for the Decision**

### 1. Admissibility of the appeals

#### 1.1 According to respondent 1, appellant 1's appeal was inadmissible because all the requests filed with its grounds of appeal could have been filed in the proceedings before the opposition division, were not allowable either, and thus were inadmissible.

However, filing new sets of claims, irrespective of whether they are allowable, is not sufficient to hold an appeal inadmissible, and in particular is not sufficient to hold the grounds of appeal to be insufficient (T 934/02, Reasons 2) if reasons have been given as to why the impugned decision is to be set aside, which was the case here. Thus, the sole reason put forward for holding appellant 1's appeal to be inadmissible is flawed. Therefore, appellant 1's appeal is admissible.

1.2 Likewise, appellant 2's appeal is admissible.

2. Main request and first auxiliary request - admission

These requests were filed with appellant 1's grounds of appeal. Since they are not allowable (see below) it is not necessary to make a finding on their admission under Article 12(4) RPBA.

3. Main request - Article 123(2) EPC

3.1 Appellant 1 requested that this objection not be dealt with in the present decision because it had been raised by appellant 2 after the expiry of the time limit for filing a reply to appellant 1's grounds of appeal.

3.2 This objection was also raised by respondent 1, who filed an appeal which it subsequently withdrew. Respondent 1 is thus still party to the proceedings. There is no reason not to consider this objection in the present decision, at least because respondent 1 is still party to the proceedings and because the main request and the first and second auxiliary requests are uncontestedly broader in scope than the request held allowable by the opposition division.

3.3 The limitation in claim 1 to copper for the catalytically active transition metal, the limitation of the upper limit for the crystallite size and the limitation of the isotype framework structures of CHA to SSZ-13 amount to an individualisation which might be allowable under Article 123(2) EPC if it were pointed to in the application as originally filed. In this context it is contentious whether "Zeolite C", i.e. the example according to the invention, relates not only to copper as the catalytically active transition metal,

but also to a SSZ-13-type zeolite. Put another way, while there is a general disclosure of selecting the CHA catalyst isotype structure from the group consisting of Linde-D, Linde-R, SSZ-13, LZ-218, Phi and ZK-14 (page 3, from line 11 onwards; see also claim 9), the question to be decided is whether the application documents as filed contain a pointer not only to copper and the upper limit for the crystallite size called for in claim 1, but also to select SSZ-13 from the aforementioned list of isotype structures.

- 3.4 Appellant 1 essentially argued that Zeolites B and C referred to on pages 6 to 8 constituted a pointer to SSZ-13. In particular, Zeolite C clearly had an isotype structure of this kind because (i) its X-ray diffraction (XRD) pattern was identified as CHA-type, (ii) the product had a suitable  $\text{SiO}_2/\text{Al}_2\text{O}_3$  ratio (SAR) and (iii) the template material or structure-directing agent (SDA) used was NNNANOH. This was confirmed by the declaration D37. In addition, Zeolite B was prepared according to D10/D22 and was identified by XRD in the application as filed as a CHA zeolite.

Furthermore, in the procedure for preparing Zeolite C set out on page 6, reference was made to D3, which dealt with SSZ-13. Example 9 in column 10 of D3 appeared to have been identified not as SSZ-13 but only as chabazite because impurities were present. However, this indicated that in example 9 of D3 the correct SAR was not obtained and thus no SSZ-13 was obtained. Finally, in both D3 and D4 the products were identified by XRD and said to have the chabazite structure. This was consistent with the position taken in the application as filed. Thus, there was no doubt for the skilled person that Zeolites B and C were SSZ-13. This was supported by the passage on page 1, lines 15 to 19,

of the patent in suit.

- 3.5 Appellant 1's submissions are not persuasive for the following reasons.
- 3.5.1 Apart from the examples, there is no passage that could possibly be construed as a pointer to the claimed subject-matter specifically requiring the isotype structure to be SSZ-13. The passage on page 1, lines 15 to 19, referring to D3, relates to the presentation of the background art and therefore fails to point to this specific isotype structure. It thus remains to be examined whether the zeolites prepared in the examples can serve as such a pointer.
- 3.5.2 It is not contested that Zeolite A is not of the SSZ-13 type, despite being of the general class of chabazite. As Zeolite B has a mean crystallite size of 0.5 micrometres, determined by a scanning electron microscope (SEM) (see Table 1), and claim 1 requires the size to be greater than this value, Zeolite B is not covered by claim 1. Therefore, the only embodiment that could potentially serve as a pointer to the claimed subject-matter is Zeolite C, which has a crystallite size of 1.4 micrometres determined by an SEM (see Table 1). It is also not contested that the application as filed does not explicitly refer to this zeolite as being of the SSZ-13 type. Rather, on page 6, lines 18 to 20, this zeolite is identified only as being of the CHA type, i.e. of the chabazite type, while Zeolite B is expressly referred to as being "prepared according to a method of making SSZ-13" (see page 5, line 7).
- 3.5.3 It is noted that the application as filed discloses that Zeolite C is identified as a chabazite-type

material by XRD, is prepared using the same template compound or SDA as Zeolite B, namely NNNAnOH (page 5, line 14, and page 6, line 6), and has the same SAR of 24:1 (see Table 1). According to appellant 1 this was sufficient to conclude that the skilled person would directly and unambiguously recognise Zeolite C as being of the SSZ-13 type.

This line of reasoning, however, is not persuasive. Firstly, while it is common ground that SSZ-13 is a particular isotype structure of the larger chabazite class of zeolites, i.e. chabazite being the genus and SSZ-13 being the species, D3 clearly shows that a chabazite which is obviously a member of the chabazite family does not necessarily have the specific XRD pattern typical of SSZ-13. Thus, a zeolite which has an XRD pattern indicative of chabazite is not necessarily SSZ-13. Moreover, according to D3, the use of the same SDA does not necessarily result in the same type of zeolite (column 1, from line 45 onwards). Finally, examples 8 and 9 (see Table 5 of D3) suggest that using the same reactants, the same amounts of reactants and the same process conditions can result in the zeolite being of the specific SSZ-13 type or (merely) of the more general chabazite type (see column 10, lines 66 to 68). There is no basis for appellant 1's assumption that the SAR in example 9 of D3 is not in the range suitable for SSZ-13. Put another way, although example 9 of D3 fulfils the three requirements set forth by appellant 1, i.e. XRD of the chabazite type, a suitable SAR and the same SAD, no SSZ-13 was obtained in this example. For these reasons, it is concluded that the application as filed does not directly and unambiguously disclose Zeolite C as being of the SSZ-13 type.

3.5.4 In addition, when deciding on added matter it is immaterial whether the XRD pattern of, the SAR of and the SAD used for Zeolite C are "indicative" of SSZ-13 as stated in D37. What matters under Article 123(2) EPC is whether a feature is directly and unambiguously disclosed in the application as filed. This standard is not met when information in the application as filed is merely "indicative" of the contentious feature.

3.5.5 For these reasons, it cannot be directly and unambiguously derived from the application as filed that Zeolite C is of the SSZ-13 type. Thus, this zeolite fails to provide a pointer to the claimed subject-matter, i.e. a zeolite catalyst of the SSZ-13 isotype.

3.5.6 Zeolite B in the application as filed is uncontestedly prepared according to D10/D22 and is of the SSZ-13 type. But, as stated above, this zeolite is not covered by claim 1 and thus cannot serve as a pointer to the combination of features making up the subject-matter claimed in claim 1.

3.6 Consequently, the requirement of Article 123(2) EPC is not met for the main request.

4. First auxiliary request - Article 123(2) EPC

Since claim 1 of the first auxiliary request contains the same contentious feature as claim 1 of the main request, this request is not allowable for the same reasons as the main request.

5. Second auxiliary request - admission and Rule 80 EPC

5.1 This request is the same as the second auxiliary request appellant 1 had filed with its grounds of appeal, except that dependent claims 4 and 6 had been deleted, the remaining dependent claims being renumbered and a new dependent claim 5 added. This request essentially corresponds to the request found allowable by the opposition division, but without the "SSZ-13" feature in claim 1. The entire list of chabazite-type zeolites according to claim 5 as granted or claim 9 as filed has been included in dependent claim 5. This request *prima facie* overcomes the objection under Article 123(2) EPC discussed above in the context of the main request. Moreover, there is no issue with Rule 80 EPC because the new dependent claim 5 cannot be considered to have been merely added to the set of claims as granted; instead, it constitutes a redraft of claim 5 as granted as a dependent method claim combining the method claims as granted and product claim 5 as granted, on which the method claims depended.

5.2 Thus, this request is admitted (Articles 12(4) and 13(1) and (3) RPBA). It is also found to comply with Rule 80 EPC.

6. Second auxiliary request - amendments

6.1 While there is agreement amongst the parties that claim 1 of this request is essentially based on a combination of originally filed claims 1, 2, 8, 9, 12 to 14 and 19, appellant 2 and respondent 1 submitted that, in order to arrive at the claimed subject-matter, copper had to be selected from a list of nine in claim 1 or a list of three in claim 2, and the upper

limit for the crystallite size had to be selected from a list of three values or from a specific embodiment disclosed on page 3, lines 1 to 5, of the application as filed.

- 6.2 There is, however, a clear pointer to copper in the application as filed. For instance, Zeolites A to C are all loaded with copper (see Table 2). Moreover, claim 3 as originally filed states that the catalytically active transition metal "consists of copper". Claim 1 now refers to "at least one catalytically active transition metal, which is copper", i.e. it does not contain the expression "consists of copper". Yet the omission of the latter expression is no bar to compliance with Article 123(2) EPC because the expression "at least one catalytically active transition metal", to which claim 3 as filed refers, is an open expression and does not exclude the presence of other metals.
- 6.3 There is also a pointer to choosing the lowest upper limit of <5.0 micrometres from the list of three values disclosed on page 3, lines 4 and 5, of the application as filed because this is the limit which is closest to the sole example of a zeolite used in the claimed method, i.e. Zeolite C, which has a crystallite size of 1.4 micrometres.
- 6.4 It is true that there is no example in the application as filed for the method as now claimed. However this in itself is not sufficient to find non-compliance with Article 123(2) EPC. Clearly, example 4 is labelled "Activity Test" and is thus intended to generally demonstrate the effect relied upon as stated at the bottom of page 8, and not necessarily to represent an embodiment of the methods called for in the claims as



originally filed.

- 6.5 The basis for the dependent claims is in their counterparts as originally filed.
- 6.6 It is thus concluded that the requirement of Article 123(2) EPC is met.
- 7. Second auxiliary request - clarity and sufficiency of disclosure
  - 7.1 Respondent 1 objected to the expression "wherein the mean crystallite size of the aluminosilicate zeolite determined by scanning electron microscope is... < 5.0 micrometers", arguing that this expression lacked clarity because of the value "< 5.0 micrometers" taken from the description.

This objection, however, is in fact directed not at the above value but instead at the allegedly unclear definition of "mean crystallite size" and to the alleged lack of clarity concerning the exact measurement method to be employed. Thus, this objection relates to features present in the claims of the patent as granted, which already referred to the feature "mean crystallite size" in the context of its lower limit. As this alleged lack of clarity is not introduced by including the upper limit for the crystallite size, this objection is rejected as inadmissible (G 3/14).

- 7.2 According to appellant 2 and respondent 1, the method employed in the patent to determine the mean crystallite size was highly unusual and/or this parameter could not be determined in particular because there were different definitions of "mean". Furthermore, since the patent did not give any example

that the method now recited in claim 1 would cover and the examples were not repeatable or contained inconsistencies, there was a lack of sufficiency of disclosure. There was no effect shown over the whole range claimed either.

- 7.2.1 The argument relating to how the "mean" crystallite size can be determined relates to an alleged lack of clear boundaries for the scope of the claims, and thus to an alleged lack of clarity which does not cover the whole scope of the claim such as to be a bar to sufficiency of disclosure.
- 7.2.2 It is true that the patent does not contain a specific embodiment of a method according to claim 1. In fact the sole method disclosed in the patent relates to testing the activity of the zeolites it discloses (see example 4). In this method no upstream oxidation catalyst is employed. This, however, is not enough to show that there is insufficient disclosure. There is no indication whatsoever that the skilled person would not be able to carry out the claimed method, including the upstream catalytic oxidation, when armed with the information contained in the patent and using their common general knowledge.
- 7.2.3 Moreover, the inconsistencies in the examples of the patent alleged by respondent 1 have not been shown to reach such a level that the skilled person using their common general knowledge would not be able to carry out the method according to claim 1.
- 7.2.4 Finally, whether the method according to claim 1 achieves an effect which is not claimed is a question of inventive step and is immaterial for the issue of

sufficiency of disclosure.

7.3 For the above reasons, the requirement of sufficiency of disclosure according to Article 83 EPC is met.

8. Second auxiliary request - novelty

Appellant 2 and respondent 1 alleged a lack of novelty in view of D13, D6 and D19, arguing that the features relating to the crystallite size and the oxidation catalyst should be ignored in the assessment of inventive step. Since these features are mandatory features of the claimed method, they cannot be ignored when assessing patentability. Hence, there is no reason to consider the above documents to be novelty-destroying for the subject-matter of the sole independent claim, claim 1 (Article 54(1) and (2) EPC).

9. Second auxiliary request - inventive step

9.1 The invention concerns a method of converting nitrogen oxides ( $\text{NO}_x$ ) in a gas to nitrogen ( $\text{N}_2$ ) by contacting the  $\text{NO}_x$  with a nitrogenous reducing agent in the presence of a synthetic aluminosilicate zeolite catalyst.

9.2 As for the closest prior art, respondent 1 proposed D2, D6, D13, D19 and D4 whereas appellant 1 started from D2, D6 or D13.

While D4 concerns a method of converting  $\text{NO}_x$  into  $\text{N}_2$ , no nitrogenous reducing agent is used (see claim 13) and, moreover, D4 addresses more remote processes such as conversion of lower alcohols (claim 11) and production of dimethylamine (claim 17). For this reason, D4 does not represent a promising starting

point or the closest prior art when assessing inventive step. Conversely, the remaining documents all concern a method as set out in point 9.1 above, i.e. a method in which  $\text{NO}_x$  are contacted with a nitrogenous reducing agent in the presence of a synthetic aluminosilicate zeolite (see D2, claim 23; D6, paragraphs [0132] and [0133]; D13, paragraphs [0050] and [0061]; D19, abstract). As none of these documents discloses a crystallite size in the claimed range of above 0.5 micrometres and below 5 micrometres (see also point 8 above) and since it was not obvious to adopt a crystallite size in this range for the reasons set out below, the question of whether one or the other of D2, D6, D13 or D19 represents the closest prior art need not be answered.

- 9.3 According to the patent, the problem to be solved was the provision of a method of converting  $\text{NO}_x$  in which the activity of the zeolite used is increased in both the aged state and the fresh state (see example 4, paragraphs [0038] and [0039] and Table 2 of the patent in suit).
- 9.4 Claim 1 of the second auxiliary request proposes solving this problem by a method of converting  $\text{NO}_x$  in a gas to nitrogen by contacting the  $\text{NO}_x$  with a nitrogenous reducing agent in the presence of a synthetic aluminosilicate zeolite catalyst of the CHA type, characterised in particular in that the mean crystallite size of the aluminosilicate zeolite determined by a scanning electron microscope is  $>0.50$  micrometres and  $<5.0$  micrometres.
- 9.5 As for the success of the solution, appellants 1 and 2 agreed that in the method according to claim 1 the activity of the zeolite in both the fresh state and the

aged state is increased. This was also the view taken by the opposition division (see the decision under appeal, item 10.1). Only respondent 1 argued that it was not credible that the effect occurred over the whole range claimed. However, respondent 1, who bears the burden of proof in this respect, has not provided any evidence to suggest that there was no improvement over the entire scope claimed. In the absence of such evidence, it is concluded that the proposed solution solves the stated problem, and so there is no need to reformulate the problem to be solved.

9.6 As for obviousness, D33 is the only document which might be considered to teach increasing the crystallite size in order to increase the zeolite's catalytic activity not only after ageing but also in the fresh state. D33 is also the only document on which appellant 2 relied in this respect. D30 does not mention a crystallite size increase and was cited only in respect of the NO to NO<sub>2</sub> ratio. D34 (see page 3, lines 24 to 27) and D36 (page 59, section 3.2.2) at most teach increasing the crystallite size in order to counteract negative effects due to ageing, but do not mention catalytic activity in the fresh state, as correctly held by the opposition division (see decision under appeal, item 10.2).

9.6.1 It is uncontested that D33 teaches increasing the crystallite size in order to increase catalytic activity after ageing of the zeolite (see in particular page 2, from line 43 onwards). Appellant 2, however, also refers to other passages of D33 in order to show that this document taught having the mean crystallite size in the required range of >0.5 micrometres and <5.0 micrometres in order to increase the activity of the

zeolite in the fresh state too.

- 9.6.2 The passage on page 3, lines 47 to 54, mentions that "high activity" is achieved "even after contact with a high-temperature exhaust gas", i.e. even after ageing, "by use of a crystalline aluminosilicate having a primary particle size of not less than 0.5 micron...".

This passage, however, is not sufficient to show that it was obvious to work in the claimed range of above 0.5 and below 5.0 micrometres because it teaches using either 0.5 micrometres, which is outside the claimed range (as is Zeolite B of the patent in suit; see 3.5.2 above), or any value above that value, which is not necessarily within the claimed range. Moreover, in the light of the passage on page 2, lines 43 to 49, and against the backdrop of the general purpose underlying D33, namely to counteract the significant deterioration in the zeolite's activity at high operating temperatures (see page 2, lines 14 to 18), i.e. after ageing, these passages teach increasing the crystallite size of a zeolite which already has high activity in order to prevent a decrease in activity due to ageing. Put another way, these passages do not clearly teach increasing the crystallite size in order to increase the activity of the fresh zeolite, let alone having the mean crystallite size in the claimed range.

- 9.6.3 According to appellant 2, when comparing the results given in Tables 6 and 8 of D33 for the comparative catalyst 1, which has a crystallite size of 0.1 micrometres (see page 5, lines 57 and 58), with those for Cu-TG45 and Cu-TG70, which have a crystallite size of 3 micrometres and 20 micrometres respectively (see page 4, lines 19 and 20, and page 5, lines 8 and 9), the skilled person would be taught to work in the

claimed range in order to increase the activity of the catalyst in both the fresh state and the aged state.

It is true that on the basis of a comparison of the results given in Table 6 with those for the comparative catalyst 1 given in Table 8, D33 clearly teaches that the disclosed catalysts according to the invention have higher activities in both the fresh state and the aged state. However, since the crystallite size of Cu-TG70 is outside the claimed range of below 5.0 micrometres, the question arises whether the skilled person would have chosen the crystallite size of 3 micrometres (Cu-TG45) and not the crystallite size of 20 micrometres (Cu-TG70). A closer look at Table 6 reveals that at 300, 400 and 450°C the catalyst Cu-TG45 performs better than Cu-TG70 in the fresh state, whereas at 350°C the contrary is the case, and at 500°C both catalysts have the same performance (see the values in the column for reaction 1). Concerning the catalysts in the aged state (reaction 2), Cu-TG70 is generally better than Cu-TG45 at all temperatures above 300°C. Thus, considering the problem to be solved, i.e. to increase the activity of the zeolite in both the aged state and the fresh state, the comparison of Tables 6 and 8 of D33 does not clearly point to the use of a crystallite size of 3 micrometres, i.e. to work in the range claimed for the crystallite size. Rather, the skilled person may consider using a crystallite size of as high as 20 micrometres (Cu-TG70), in particular because the essence of the invention according to D33 is to increase catalytic activity after ageing (see page 2, lines 43 to 49, and page 3, lines 50 to 54) and because the Cu-TG70 catalyst generally performs better in this respect.

Since there is no clear teaching to work in the claimed

range when seeking to solve the stated problem, it must be concluded that the subject-matter of claim 1 is not obvious in view of the cited prior art.

9.7 The requirement of inventive step set forth in Article 56 EPC is thus met for the subject-matter of claim 1. The same holds true for dependent claims 2 to 5.

10. Adapted description

The description has been adapted to the claims of the second auxiliary request and there are no objections in this regard. Thus, it is concluded that the requirement of support in the description set forth in Article 84 EPC is met.



## Order

### For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the department of first instance with the order to maintain the patent in amended form on the basis of the following documents:
  - claims 1 to 5 according to the second auxiliary request submitted during the oral proceedings;
  - description paragraphs 1 to 39 submitted during the oral proceedings.

The Registrar:

The Chairman:



C. Vodz

E. Bendl

Decision electronically authenticated