

**Internal distribution code:**

- (A) [ ] Publication in OJ  
(B) [ ] To Chairmen and Members  
(C) [X] To Chairmen

**D E C I S I O N**  
of 15. February 2001

**Case Number:** T 0642/97 - 3.3.7

**Application Number:** 91201063.4

**Publication Number:** 0458378

**IPC:** B01J 29/22

**Language of the proceedings:** EN

**Title of invention:**  
Catalyst composition

**Patentee:**  
SHELL INTERNATIONALE RESEARCH MAATSCHAPPIJ B.V.

**Opponent:**  
KataLeuna GmbH Catalysts

**Headword:**

-

**Relevant legal provisions:**  
EPC Art. 56, 113(1), 114(1),(2), 123(2)  
EPC R. 67, 68(2), 76

**Keyword:**  
"Inventive step - problem and solution"  
"Reimbursement of appeal fee (no)"  
"Minutes not incomplete - reasons of the decision sufficient"

**Decisions cited:**  
T 0197/86, T 0838/92, T 0740/93, T 0182/92, T 0367/91,  
T 0231/99, T 0212/97

**Catchword:**

-



Case Number: T 0642/97 - 3.3.7

**D E C I S I O N**  
of the Technical Board of Appeal 3.3.7  
of 15. February 2001

**Appellant:** SHELL INTERNATIONALE RESEARCH  
(Proprietor of the patent) MAATSCHAPPIJ B.V.  
Carel van Bylandtlaan 30  
NL-2596 HR Den Haag (NL)

**Representative:** -

**Respondent:** KataLeuna GmbH Catalysts  
(Opponent) Am Haupttor  
D-06236 Leuna (DE)

**Representative:** Schrell, Andreas, Dr.  
Gleiss & Grosse  
Patentanwaltskanzlei  
Maybachstrasse 6 A  
D-70469 Stuttgart (DE)

**Decision under appeal:** Decision of the Opposition Division of the  
European Patent Office dated 15 April 1997 and  
issued in writing on 24 April 1997 revoking  
European patent No. 0 458 378 pursuant to  
Article 102(1) EPC.

**Composition of the Board:**

**Chairman:** R. E. Teschemacher  
**Members:** B. J. M. Struif  
R. Young

## Summary of Facts and Submissions

I. The mention of grant of the European patent No. 0 458 378, in respect of European patent application No. 91 201 063.4, filed on 3 May 1991 and claiming GB priority of 22 May 1990 (GB 9011412) was published on 5 January 1994 (Bulletin 94/01). Claim 1 read as follows:

"Catalyst composition, suitable for use in a process for the isomerization of C<sub>8</sub>-alkyl aromatics comprising a Group VIII metal and an alkali metal containing zeolite and a binder material as support, the amount of alkali metal being between 2 and 3 % by weight on the zeolite, which is preparable by a process, wherein an alkali containing zeolite is prepared and extruded together with a binder material, the resulting extrudate is calcined, loaded with a compound of a Group VIII metal and further calcined, followed by reducing the Group VIII metal."

Claim 2, a dependent claim, was worded, after correction of a typographical error, as follows:

"Catalyst composition as claimed in claim 1, wherein the alkali metal containing zeolite is prepared by adjusting the alkali level by ion-exchange within a pre-selected range."

Claims 3 to 12 were dependent claims, directed to elaborations of the catalyst composition according to claim 1.

Claim 13, an independent claim, read as follows:

"Process for the isomerization of C<sub>8</sub>-alkyl aromatics wherein the C<sub>8</sub>-alkyl aromatics are contacted with a catalyst composition as claimed in any of claims 1-12."

II. Notice of Opposition was filed on 8 September 1994 on the grounds of Article 100(a) EPC in conjunction with Articles 54 and 56 EPC. The opposition was supported inter alia by the following documents:

D1: DD-C-121 320 and

D2: DE-B-1 920 546 as well as the later filed but admitted documents

D3: DE-B-1 545 418

D4: GB-A-1 383 871

D5: John Ward, "Molecular Sieve Catalysts", Applied Industrial Catalysis, Vol. 3 1984, pages 271-76

D6: H. H. John: "Die Herstellung dealuminiertes Zeolithe und ihre Eignung bei katalytischen Reaktionen", Martin-Luther-Universität Halle/Wittenberg Okt. 1970, pages 39, 81-84, 238.

By a decision, announced at oral proceedings held on 15 April 1997 and issued in writing on 24 April 1997, the Opposition Division revoked the patent. The decision was based on a set of claims 1 to 12, filed on 14 March 1995 forming a main request and on an

auxiliary request which was a modification of the main request expressed only in outline form.

Claim 1 of the main request differed from claim 1 as granted by the insertion of the words "... is brought within the given range by ion-exchange with ammonium salt" in place of the phrase "is prepared ...".

Claim 2 as granted had been cancelled and granted claims 3 to 13 renumbered into claims 2 to 12.

Claim 1 of the auxiliary request differed from claim 1 of the main request in that the term "zeolite" was replaced by the term "mordenite" by incorporating dependent claim 2 of the main request into claim 1.

According to the decision, claim 1 of the main request and of the auxiliary request were novel but lacking an inventive step. The technical problem arising from D1, which was considered to represent the closest prior art, was that of providing a catalyst composition which was selective for xylenes when used in a process for the isomerization of C<sub>8</sub>-alkyl aromatics and which led to low loss in C<sub>8</sub>-aromatics. The solution, to alter the alkali content of the zeolite by means of ion-exchange with an ammonium salt, represented a different approach from the teaching of D1, which was to achieve the alkali content by treatment with a strong acid followed by partial neutralization with alkali hydroxide or carbonate in order to increase the pore size. The scope of claim 1 of both requests encompassed large pore, medium pore and small pore zeolites. The latter had, however, been admitted by the proprietor not to

be suitable for the isomerization of C<sub>8</sub>-alkyl aromatics. Hence the problem addressed by the patent in suit was only partly solved and the subject-matter of claim 1 lacked an inventive step.

As regards the auxiliary request, in particular whilst the Patentee had criticised the experiments of the Opponents (filed on 14 January 1997), which were intended to show that when using "small pore" mordenite worse results were obtained following the treatment according to the patent in suit than following the teaching according to D1 and although he had argued that the skilled person would not use such a small pore zeolite, nevertheless it had not been proved by the Proprietor that a specific mordenite would automatically be fixed upon by the skilled person, since the patent in suit did not contain any such teaching. Furthermore, the comparative examples submitted by the Patentee on 14 March 1995 were not reliable because the catalyst used in the comparison had a sodium content falling outside claim 1 of the patent in suit, so that there was more than one variable in operation. In summary, the scope of claim 1 included mordenites which would not solve the technical problem as well as those used in D1, so that the subject-matter of this request lacked an inventive step.

III. On 16 June 1997, a Notice of Appeal against the decision was filed, the prescribed fee being paid on the same day. In the Statement of Grounds of Appeal, filed on 14 August 1997, the Appellant (Patentee) referred for the first time to the following document:

D7: David A Whan, "Structure and catalytic activity of zeolites", Chemistry in Britain, 1981, pp 532-535.

With a letter received on 17 March 1998, the Appellant filed four further auxiliary requests in addition to the main request and the auxiliary request (now first auxiliary request) filed during opposition proceedings.

The Respondent (Opponent) disagreed, in submissions filed on 20 November 1997 and 18 June 1998, respectively, with the arguments of the Appellant and cited, in the latter submission, the following document for the first time

D8: V. R. Chumbhale, A.J. Chandwadkar and B.S. Rao: "Characterization of siliceous mordenite obtained by direct synthesis or by dealumination", Zeolites 1992, Vol. 12, 63.

IV. The Appellant argued in substance as follows:

- (a) The main reason for denying an inventive step had not been that an obviousness position existed with respect to the prior art but rather that the technical effect taught by the claimed subject-matter did not extend to all embodiments covered by the claim. This was, if anything, an objection under Article 84 EPC which was not itself a ground for opposition.
- (b) It was in any case general knowledge what types of zeolites would be useful in isomerizing C<sub>8</sub>-alkyl aromatics, without mention thereof

being necessary in the patent specification, and in particular that the spaces within the crystallites had to have dimensions close of those of the reactant or product molecules. Partially blocked zeolites with amorphous impurities or cations such as those tested by the Respondent were self-evidently unsuitable.

- (c) Furthermore, it had been shown that clean mordenites performed better in a catalyst composition after having been treated according to the patent in suit. It had even been shown, as emerged from the experiments of the Respondent, that a blocked mordenite treated according to the patent in suit would perform to some extent whereas an untreated such blocked mordenite would not perform at all. Consequently the advantage of the claimed subject-matter had indeed been shown for all mordenites.
  
- (d) The Appellant's test report had been disregarded, because two variables but not one had allegedly been used, although in a preliminary opinion the Opposition Division seemed to have accepted an inventive step in the light of this test report. On the other hand in the case of the Respondent's test report, the starting materials had not been specified and the platinum had been added at a different stage as compared with the claimed subject-matter. Thus, this latter test report did not prove anything with respect to the claimed subject-matter. Further, the impugned decision did not take into consideration the Appellant's comparison between the test reports of both



parties, whereas the onus had in any case been on the Opponent to provide a complete set of relevant tests.

- (e) This unequal treatment of the submissions of the Appellant, and in particular the absence, from the minutes of the oral proceedings held on 15 April 1997, of the relevant associated submissions of the Appellant amounted to a substantial procedural violation.
  
- (f) Quite apart from the above, when using the problem solution approach, the claimed subject-matter was not made obvious by D1, D3 and D4. D1 was directed to a process to deblock a blocked mordenite by means of a strong acid but did not emphasize the claimed amount of alkali metal to be used, and thus addressed a different problem. In D3 the zeolite was preferably entirely in the H-form and the addition of the Group VIII metal in the manner as claimed was not mentioned. D4 should have been regarded as nearest prior art. The post-doping of the shaped extruded and calcined mixture of zeolite and binder as defined in claim 1, however, provided an improved technical effect over D4, as had already been demonstrated during examination proceedings in the submissions dated 18 February 1993.

V. The Respondent argued substantially as follows:

- (a) The claims of all requests were not inventive because the problem to be solved over D1, namely to achieve a high ATE for ethyl benzene content

(low ethyl benzene content in the product) of the product and a low loss of C<sub>8</sub>-alkyl aromatics during isomerization was not solved by all of the embodiments covered by claim 1. The small and middle size zeolites covered by claim 1 would not provide an improved (surprising) conversion rate. The Appellant had at most shown a technical effect for open, large pore zeolites when treating them with ammonium salt. However, the claimed invention did not exclude small pore or medium pore zeolites and the patent specification did not differentiate the zeolites with respect to their pore sizes.

- (b) The test report submitted by the Appellant on 9 May 1995 could not be taken into consideration as several parameters had been varied (see T 197/86, OJ EPO 1989, 371). The Appellant had not provided any experiments showing that the effect had its origin in the distinguishing feature of the invention.
  
- (c) The solution was obvious when considering D1 and D3 or D1 and D4. In D1 as nearest prior art document only small pore zeolites were acid treated to widen the pores, which acid treatment was not necessary when treating large pore zeolites. D3 was directed to a catalyst for isomerizing ethyl benzene and used a treatment with ammonium salts for large pore zeolites. D4 related to the same technical field and used an acid treatment or an ammonium salt treatment to regulate the alkali content. Also when starting from D3 as nearest prior art it would have been obvious to control the alkali content as claimed

when considering D4. An obvious solution was also provided when starting from D4 and combining its teaching with that of D3 and/or D1.

VI. By letter of 24 September 1998 the Respondent withdrew the Opposition.

VII. The Appellant requested that the decision under appeal be set aside and that the patent be maintained in amended form based on a main request based on a set of claims 1 to 12 filed on 14 March 1995 with letter dated 9 March 1995 and five auxiliary requests filed on 17 March 1998.

In addition, the Appellant requested reimbursement of the appeal fee since the detailed arguments and explanations presented by the Appellant during oral proceedings were not considered by the Opposition Division.

### **Reasons for the Decision**

1. The appeal is admissible.
2. With the withdrawal of the opposition during the appeal proceedings the Respondent ceased to be a party to the appeal proceedings in respect of the substantive issues.
3. *Admissibility of late filed documents D7 and D8*
  - 3.1 D7 is a review article on zeolites and concerns the crucial issue of the role of the pore size in

catalyst activity and was filed by the Appellant in response to the finding in the decision under appeal that the technical effect taught by the claimed subject-matter did not extend to embodiments of certain pore sizes covered by claim 1. Its introduction has not been opposed by the former Respondent and in view of its relevance to issues already raised the Board sees no objections to its introduction into the proceedings under Article 114(1) EPC. It will consequently be taken into consideration.

- 3.2. D8 was filed by the former Respondent and is primarily concerned with the aspect of the  $\text{SiO}_2/\text{Al}_2\text{O}_3$  ratios which are not central to the subject-matter of the patent in suit and was furthermore published in 1992, i.e. after the relevant priority and filing dates. It is thus prima facie irrelevant to the subject-matter of the patent in suit and will be disregarded under Article 114(2) EPC.

4. *Admissibility of the main request*

Claim 1 of the main request differs from claim 1 of the granted patent in that an ion-exchange with an ammonium salt is used to bring the alkali metal within the claimed range. The finding, in the decision under appeal, that this amendment met the requirements of Articles 123(2) and (3) EPC has not been challenged by the former Respondent, and the Board has no reason to take a different view. Consequently the amendments are held to be admissible according to Article 123 EPC.

5. *Novelty (main request)*

The finding, in the decision under appeal, that the claimed subject-matter was novel has also not been disputed and the Board sees no reason to take a different view. Consequently the claimed subject-matter is held to be novel.

6. *The patent in suit; the technical problem and its solution (main request)*

The patent in suit relates to a catalyst composition suitable for the isomerization of C<sub>8</sub>-alkyl aromatics, by which a high ATE (approach to equilibrium value) for ethyl benzene (which means that there is a high conversion of ethyl benzene into the more desirable xylene products) combined with a low-loss of C<sub>8</sub>-alkyl aromatics (xylenes) is obtained (page 2, lines 39 to 41).

Such a catalyst composition is, however, known from D1 which, according to the decision under appeal, represented the closest prior art.

6.1 D1 discloses a catalyst composition, suitable for use in a process for the isomerization of C<sub>8</sub>-alkyl aromatics, comprising a Group VIII metal and an alkali metal containing mordenite which has been treated with a strong acid which is afterwards neutralized so that 20 to 60% by equivalent of the potential cation positions remaining after acid treatment is replaced with alkali ions (claim 1). The mordenite can be mixed and extruded with an aluminum oxide hydrate binder, the extrudate being calcined and loaded with a platinum metal compound (claim 5). The treatment with acid instead of an ammonium salt results in widening the pores of the mordenites by

removing amorphous parts or structural blocks and aluminum atoms out of the lattice (page 4, second paragraph). According to the examples, the application of such catalysts to the isomerization of C<sub>8</sub>-alkyl aromatics containing ethyl benzene results in a reduction of the amount of ethyl benzene and a higher amount of xylenes (Tables 1 and 2).

6.2 Compared with this state of the art, the technical problem may be seen in the provision of a catalyst to be used in a process for the isomerization of C<sub>8</sub>-alkyl aromatics, whereby a higher ATE for ethyl benzene is achieved with minimal loss of C<sub>8</sub>-aromatics.

6.3 The solution proposed according to claim 1 is that the alkali content is brought within the given range by using an ion exchange with an ammonium salt.

6.4 It has not been disputed that the examples and comparative examples of the patent in suit show a simultaneous improvement of the ATE value and reduction of loss of C<sub>8</sub>-alkyl aromatics as the alkali metal content of the mordenite is adjusted, using the relevant mechanism of ion exchange with ammonium salt, into the relevant range of 2 to 3% by weight of the zeolite; all other variables being held constant (Examples 2 to 4 and comparative Examples A and B). This represents a comparison with a variant lying closer to the claimed subject-matter than D1. Nor has it been contested that the relevant ATE and C<sub>8</sub>-alkyl aromatic loss values exemplified according to the claimed subject-matter are favourable compared with those obtained according to D1.

6.5 As regards the Appellant's comparative tests, filed

on 14 March 1995, furthermore, these showed an even more strikingly improved relevant ATE value for the catalyst prepared according to the patent in suit, compared with that of a replication of the catalyst according to D1 (appendix to submission, Table III).

- 6.5.1 The former Respondent's criticism of these tests on the basis that the replication of the catalyst according to D1 resulted in an alkali metal content of the latter of 1.72, which fell outside the relevant range of 2 to 3% according to the patent in suit and thus formed a second variable, is not convincing, since (a) the deviation is small and (b) it was in any case already known that such a reduction in the alkali metal content of the zeolite would generally result in a higher ATE value, albeit at the cost of greater losses of C<sub>8</sub>-alkyl aromatics (patent in suit, page 2, lines 24 to 26).
- 6.5.2 Consequently, the fact that the comparative catalyst had a slightly lower alkali metal content would be expected to increase its relevant ATE value and hence reduce the margin of improvement displayed by the claimed subject-matter. Since, however, a still greater increase in ATE value was recorded according to the comparative tests, the latter are, if anything a more convincing demonstration of the superiority of the catalyst according to the patent in suit.
- 6.5.3 From the above, it follows that the Appellant's voluntary comparative experiments filed on 14 March 1995, are as close as possible to D1 and plausibly showed that the relevant technical effect has its origin in the distinguishing ammonium salt treatment, so that they are also in line with the requirement

referred to in decision T 197/86 (*supra*).

6.6 The further criticism, that the relevant effect would not be achieved with small, medium or blocked large pore mordenite zeolites was evidentially only supported by comparative tests submitted by the former Respondent on 14 January 1997. Since, however, none of these tests was carried out according to claim 1 of the patent in suit, as the calcination-Group VIII metal loading-calcination step sequence was omitted, the latter nevertheless also being crucial for obtaining the relevant effect, as shown by the uncontested experimental report filed during the examination proceeding (submissions filed on 18 February 1993), the former Respondent's experiments are consequently irrelevant. Thus, the case of the former Respondent in this respect amounts to nothing more than an unsupported allegation that certain unspecified types of mordenites would be ineffective.

6.7 Whilst it is true that the Appellant indicated that the effect was not obtained with blocked pores, since the ammonium salt treatment would not effectively unblock them, nevertheless this was stated in the context that a zeolite which was unsuitable would not be used (submissions filed on 20 February 1997 during the opposition proceedings, page 3, last paragraph of section 1 "As to the technical effect of the claimed subject-matter").

6.7.1 The submission that the unsuitability of zeolites of inappropriate pore size would have been well known to the skilled person has furthermore been corroborated, in the appeal, convincingly in the Board's view by



reference to D7, a review article in a journal widely circulated to professional chemists according to which "the most important feature of zeolites is that the spaces within the crystallites have dimensions close to those of the reactant or product molecules" (see page 537, left column). In the latter connection, it was well known from D5, a standard text, that natural mordenite zeolites which were partially blocked by amorphous impurities or cations would only result in an effective diameter of about 4 Å, which was clearly not suitable for the relevant purpose (D5, page 276, first paragraph). Thus, it is evident that it belonged to the general knowledge of the person skilled in the art to start from a zeolite of proper pore size having regard to the claimed subject-matter.

6.7.2 For the rest, the former Respondent's arguments concerning the effectiveness of the solution of the technical problem rest on an assertion, based on a comparison with the teaching of D1, that the results of using a catalyst with small pores according to D1 would be better than applying the ammonium salt exchange according to the patent in suit to a small, medium or blocked pore mordenite zeolite. In this connection it is, however, conspicuous that the pore size of the zeolites used according to D1 is nowhere stated or otherwise made available. Indeed this was a major criticism, by the Appellant, of the Respondent's comparative experiments filed on 14 January 1997, since these were merely a copy of what was said in D1 and thus equally did not admit of being checked (Appellant's submissions filed on 20 February 1997). This criticism has not been refuted.

6.7.3 Hence, the former Respondent's assertion rests on a comparison made with a synthetic mordenite zeolite of unspecified origin and, more particularly, unspecified pore size. The relationship of such a mordenite to that used according to D1 on the one hand and to the mordenites according to the patent in suit on the other is therefore in principle, indeterminate. It cannot therefore, serve as an appropriate basis for putting in question the effectiveness of the claimed subject-matter for mordenites of any particular pore size. In other words the comparison offered is fundamentally incapable of supporting the assertion made.

6.7.4 Consequently there is no evidential basis for doubting the Appellant's submission that the catalyst performance even of zeolites of less preferred pore size is improved by the treatment according to the patent in suit (Statement of Grounds of Appeal, point C, paragraph 1).

6.8 It was, however, the onus of the Respondent convincingly to demonstrate the validity of his contrary assertion. This he has failed to do.

6.9. In summary, the Board has no reason to doubt that the claimed measures provide an effective solution of the technical problem, and this over the whole range claimed.

6.10 Thus, the contrary finding of the decision under appeal in this respect according to which the technical problem had not been solved over the whole range claimed cannot be supported by the Board. Since, furthermore the latter finding constituted the

sole basis for the further finding that the claims of the relevant auxiliary request did not involve an inventive step, and thus for the revocation of the patent in suit, the decision under appeal must be set aside for this reason alone.

7. *Inventive step (main request)*

7.1 This does not yet answer the question whether the subject-matter claimed in the patent in suit involves an inventive step. In connection with the identity of the closest prior art, the arguments of the former Respondent were advanced in relation to D1 and D3 while the Appellant referred to D4. As the Opposition Division used D1 as nearest prior art to revoke the patent, which approach is in line with the position of the former Respondent, it is reasonable to start with this approach first.

7.1.1 It is thus necessary to consider whether the skilled person, starting from a catalyst according to D1 and faced with the problem of increasing ATE value for ethylbenzene combined with minimal losses of C<sub>8</sub>-alkyl aromatics would have expected this result to be achieved by using an ammonium salt treatment for adjusting the claimed alkali metal content.

7.1.1.1 In D1 the key feature is to use an acid treatment in order to widen the pores of the mordenites by removing amorphous parts or structural blocks and aluminum atoms out of the lattice. The acid treatment results in improving the diffusion for hydrocarbon molecules in general (D1, page 4, second paragraph). It would be contrary to the teaching of D1 to use an ammonium salt treatment, since this would mean

departing from an essential feature of its teaching. Further, the use of an ammonium salt treatment brings the alkali metal content within a specific range without disrupting the crystal structure.

7.1.1.2 Although in D1 the acid treated mordenite zeolite is neutralized in order to replace the remaining potential cation positions by alkali metal ions, no specific emphasis is put on the claimed alkali content of 2 to 3% by weight. Furthermore, D1 teaches two alternatives for the preparation of the catalyst composition (claims 4 and 5) one of which refers to the claimed extrusion-calcination-loading-calcination step sequence without the latter being mentioned in relation to the problem posed. It is, however, uncontested that both the claimed alkali content and the extrusion-calcination-loading-calcination step sequence are crucial for providing the relevant effect (Examples 2 to 4, and A and B of the patent in suit; experimental report filed on 18 February 1993). There is no hint in D1 that these two features, if combined, would provide an improvement in catalyst efficiency.

7.1.1.3 Hence, it is not suggested by D1 to combine the features referred to above in order to provide the relevant effect (D1, Examples 1 and 2).

7.1.1.4 Consequently, there is no hint to the solution of the technical problem in D1.

7.1.2 In D3, the catalyst composition is prepared by a process wherein a zeolite in H-form which may contain 0.2% by weight of alkali and may be obtained by treatment with ammonium ions, is dispersed in an

aluminum oxide sol and dropped into a forming oil, whereafter the formed particles are dried, calcined and loaded with palladium or platinum and further calcined, followed by reducing the Group VIII metal (column 2, lines 43 to 60; column 4, line 67 to column 5, line 4; Example 1).

7.1.2.1 The H-form of the zeolite is preferred because it results in an increase in catalytic activity and stability of the catalyst (column 4, lines 5 to 8). Consequently, there is no hint in D3 to adjust the alkali metal content of D1 within the claimed 2 to 3% by weight for any reason, let alone to solve the problem posed.

7.1.2.2 Even less does D3 suggest that the specific "extrusion-calcination-loading-calcination step sequence" as claimed would result in an improved ATE value. Consequently, the skilled person would not be motivated by D3 to modify the teaching of D1 in the direction of the solution of the technical problem.

7.1.3 D4 discloses a catalyst composition comprising a platinum-alumina component and a partially dealkalized mordenite which has been ion-exchanged with an ammonium salt and contains from 0.1 to 0.9 equivalents of an alkali per gram atom of aluminum which amount of alkali corresponds to 0.52 to 4.74% by weight of zeolite (see claim 1). The catalyst is prepared by mixing the partially dealkalized mordenite with platinum on alumina (see Example 3).

As D4 does not suggest that first the mixture of zeolite and binder is extruded and calcined prior to loading with the Group VIII metal which is crucial

for obtaining the relevant effect (section 6.6, above), there is no incentive for the skilled person to modify the teaching of D1 in the direction of the solution of the technical problem.

7.1.4 In summary, the solution of the technical problem does not arise in an obvious way, starting from D1 as closest state of the art.

7.2 Nor would the result be different starting from D3, since the disclosure of the latter is more remote from the solution of the technical problem than that of D1 (cf section 7.1.2, etc., above).

7.3 Finally also when starting from D4 as closest prior art, the claimed invention has not been suggested as can be gathered from the following:

7.3.1 Although D4 relates to a catalyst for the isomerization of xylene containing ethylbenzene it does not teach or suggest the claimed "extrusion-calcination-loading-calcination step sequence" which is crucial for obtaining a high ATE value and minimal losses in C<sub>8</sub>-alkyl aromatics (section 6.6, above).

7.3.2 Furthermore, the alkali content of the mordenite is defined within a broad range of 0.1 to 0.9 equivalents per gram atom of aluminum and only catalyst N fulfills the claimed alkali metal content (Table 1 of Example 3 and Table 6 of Example 8). There is no hint in D4 that for achieving the relevant effect the specified alkali metal content is critical. Even less there is any motivation in D1 or D3 to combine the claimed

"extrusion-calcination-loading-calcination step sequence" with the claimed alkali metal content for solving the problem posed.

7.3.3 Consequently, the solution of the technical problem does not arise in an obvious way starting from D4.

7.4 It follows from the above, that the subject-matter of claim 1 is based on an inventive step. The same applies to dependent claims 2 to 11 and to process claim 12 since the latter is limited to the use of the catalyst according to claim 1. Thus, the grounds of opposition do not prejudice the maintenance of the patent in amended form on the basis of the main request. The Opposition Division will have to examine whether the amendments to the claims require amendments to the description.

8. *Auxiliary requests*

As the main request is allowable there is no need for the Board further to consider the auxiliary requests.

9. *Reimbursement of the appeal fee*

9.1 The Appellant's submissions that the attacked decision and the minutes did not consider the arguments and explanations presented during the oral proceedings so that the minutes did not meet Rule 76(1) EPC and the decision was not sufficiently reasoned under Rule 68(2) EPC which amounted to a substantial procedural violation under Article 113(1) EPC are not convincing, as can be gathered from the following:

- 9.2 As the Appellant had admittedly relied in the oral proceedings before the Opposition Division on the issues which formed the basis of the decision, the Appellant has had the opportunity to present its arguments (Notice of Appeal, filed 14 August 1997, point E; Article 113(1) EPC).
- 9.3 The minutes according Rule 76 EPC should contain "the essentials of the oral proceedings ... and the relevant statements by the parties...". This provision does not require that the minutes reflect the full arguments of the parties. It is within the discretion of the minute-writer what he considers "essential" or "relevant" (T 212/97 of 8 June 1999, not published in OJ EPO, Reasons, point 2.2, referring to the Guidelines for Examination in the EPO E-III, 10). Whereas it is required that the minutes contain the requests or similarly important procedural statements, most of the arguments concerning patentability are normally apparent from the previous written submissions or from the facts and submissions in the written decision and need not be contained in the minutes. Nevertheless, if a party is of the opinion that the minutes are incomplete or wrong since essential submissions are not reflected at all in the file it may request the Opposition Division to correct the minutes to preserve its rights (T 231/99 of 31 August 1999, not published in OJ EPO). In absence of such a request, the allegation of a substantial procedural violation cannot be justified.
- 9.4 According to Rule 68(2) EPC the "decisions of the European Patent Office shall be reasoned ...". According to T 740/93 of 10 January 1996 (not



published in OJ EPO; Case Law of the Boards of Appeal, third edition 1998, VI. L. 6.3.3) the reasoning should contain in addition to the logical chain of facts and reasons on which every decision is based, at least some motivation on crucial points of dispute in this line of argumentation, in so far as this was not immediately apparent from the reasons given, in order to give the party concerned a fair idea of why his submissions were not considered to be not convincing.

9.5 It has to be checked whether the decision gives information on what arguments or explanations have been presented in the oral proceedings and whether or not this is such as to allow the conclusion that Rule 68(2) EPC has been violated. In this respect the decision as a whole must be considered whether the crucial points of dispute have been considered and whether reasons have been given why the submissions were not considered to be convincing.

9.5.1 The decision under appeal makes reference under "facts and submissions" to the comparative experiments filed with letter of 14 March 1995 (point 6) and to an intermediate communication dated 25 October 1996 (point 10). In this communication the Opposition Division provided a preliminary view on novelty and inventive step and appeared to accept an inventive step based on the Appellant's comparative tests filed on 14 March 1995 as long as the Respondent had not provided any convincing counter evidence in this respect (page 3, point 5 of said communication). Under point 11 of the decision, mention was made to comparative tests of the Respondent and for further detail reference was made

to the file. Further mention was made to the Appellant's letter of 20 February 1997 which has dealt with the deficiencies of the Respondent's comparative tests (point 12). Furthermore, from the minutes it can be gathered that there had been a long discussion on inventive step (points 5 and 8). Thus, from the "Summary of facts and submissions" of the decision under appeal the crucial facts, evidence and arguments can be derived which according to the Appellant were in dispute in the oral proceedings so that indeed the decision under appeal either directly or by way of reference mentions the relevant statements in dispute.

9.5.2 Further, the reasons for the decision give arguments why the Opposition Division did not accept an inventive step, because the problem to be solved was only partly solved by the patent in suit by referring to the Respondent's test report and to the statement of the Appellant that not all zeolites were suitable (page 8). In particular, the decision has dealt with both experimental reports under dispute and has put forward arguments why it rejected the Appellant's criticism on the Respondent's test report (pages 9 and 10 bridging paragraph) and why it did not rely on the Appellant's test report (page 10, first and second paragraph) and the comparison made by the Appellant (page 11, second paragraph). That the test report of the Appellant was disregarded and the Respondent's comparative tests were accepted is a substantive issue and is the result of a wrong and inadequate assessment of facts and evidences as outlined above (sections 9.5 and 9.6) but it does not amount to a substantial procedural violation (T 367/91 of 14 December 1992, not published in OJ

EPO; Case Law of the Boards of Appeal, *supra*, VII. D.15.4.4, dealing with a wrong assessment of prior art and/or the claimed invention; and T 182/92 of 6 April 1993, not published in OJ EPO; Case Law of the Boards of Appeal, *supra*, dealing with a wrong conclusion of the first instance regarding the priority document).

- 9.6 In summary, the decision under appeal may include at most an incorrect assessment of inventive step based on an inadequate judgement of evidence on file which does not, however, amount, in the present case, to a procedural violation. For these reasons, the request for reimbursement of the appeal fee must be rejected.

## **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 with the order to maintain the patent with claims 1 to 12 of the main request filed with letter dated 9 March 1995 and after any necessary consequential amendment of the description.
3. The request for reimbursement of the appeal fee is refused.

The Registrar:

The Chairman:

C. Eickhoff

R. Teschemacher