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**I N T E R M E D I A T E   D E C I S I O N**  
**of 27 June 2003**

**Case Number:** T 0426/00 - 3.2.4

**Application Number:** 94117307.2

**Publication Number:** 0638710

**IPC:** F01N 3/20

**Language of the proceedings:** EN

**Title of invention:**

Adsorbent for purification of automobile exhaust gas and  
method of controlling emission of unburnt hydrocarbons from  
internal combustion engine

**Patentee:**

NGK INSULATORS, LTD.

**Opponent:**

Emitec Gesellschaft für Emissionstechnologie mbH

**Headword:**

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**Relevant legal provisions:**

EPC Art. 54,(3),(4), 114(2)

**Keyword:**

"Main request: Novelty - (yes)"

"Auxiliary request I: Suspension of the appeal proceedings"

**Decisions cited:**

T 0507/99, T 0451/99, T 0166/84, G 0001/03, G 0002/03

**Catchword:**

-



Case Number: T 0426/00 - 3.2.4

**I N T E R M E D I A T E   D E C I S I O N**  
**of the Technical Board of Appeal 3.2.4**  
**of 27 June 2003**

**Appellant I:** Emitec Gesellschaft für  
(Opponent) Emissionstechnologie mbH  
Hauptstrasse 150  
D-53797 Lohmar (DE)

**Representative:** Kahlhöfer, Hermann, Dipl.-Phys.  
Patentanwälte  
Kahlhöfer Neumann  
Herzog Fiesser  
Postfach 10 33 63  
D-40024 Düsseldorf (DE)

**Appellant II:** NGK INSULATORS, LTD.  
(Proprietor of the patent) 2-56, Suda-cho, Mizuho-ku  
Nagoya City  
Aichi Pref. (JP)

**Representative:** Paget, Hugh Charles Edward  
MEWBURN ELLIS  
York House  
23 Kingsway  
London WC2B 6HP (GB)

**Decision under appeal:** Interlocutory decision of the Opposition  
Division of the European Patent Office posted  
8 February 2000 concerning maintenance of  
European patent No. 0638710 in amended form.

**Composition of the Board:**

**Chairman:** C. A. J. Andries  
**Members:** T. Kriner  
M. K. S. Aúz Castro

## Summary of Facts and Submissions

I. Appellant I (Opponent) lodged an appeal, received at the EPO on 17 April 2000, against the interlocutory decision of the Opposition Division, posted on 8 February 2000, holding that the European patent No. 0 638 710 as amended meets the requirements of the Convention. The appeal fee was paid simultaneously, and the statement setting out the grounds of appeal was received on 16 June 2000.

Appellant II (Patentee) likewise lodged an appeal, received at the EPO on 17 April 2000, against the interlocutory decision of the Opposition Division. The appeal fee was paid simultaneously, and the statement setting out the grounds of appeal was received on 25 April 2000.

II. Opposition had been filed against the patent as a whole and based on Article 100(a) EPC. The Opposition Division held that the grounds for opposition cited in Article 100(a) EPC did not prejudice the maintenance of the patent as amended according to the auxiliary request filed during the oral proceedings on 17 January 2000.

III. Oral proceedings took place 27 June 2003.

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

Appellant II requested that the decision under appeal be set aside and that the patent be maintained on the basis of claims 1 to 7 filed as main request for all

designated states during the oral proceedings or on the basis of auxiliary requests I to V also filed during the oral proceedings for the designated states DE, FR, GB and on the basis of the claims of the main request for the designated states BE, ES, IT, SE.

IV. The following documents were considered during the oral proceedings:

E3: EP-A-0 427 970  
E4: EP-A-0 369 576  
E7: US-A-5 087 348.

V. The independent claims 1, 3, 5, 6 and 7 of the main request read as follows:

"1. An adsorbent structure comprising:  
a honeycomb structure having a periphery and two ends, including a plurality of passages which are defined by partition walls and extend in an axial direction between the ends; and  
an adsorbent for purification of automobile exhaust gas coated on the partition walls and comprising a zeolite, characterised in that the zeolite is a high-silica zeolite having a Si/Al ratio of not less than 48 and is an H (proton) type zeolite or a zeolite obtained by subjecting an H (proton) type zeolite to ion exchange with at least one noble metal selected from Pt, Pd, Rh, Ir and Ru."

"3. Method of controlling emission of unburnt hydrocarbons from an internal combustion engine at start-up, comprising the steps of:

(1) providing a catalyst for hydrocarbon conversion and an adsorbent capable of adsorbing hydrocarbons when cold, said adsorbent comprising zeolite which has a Si/Al ratio of at least 48 and is an H (proton) type zeolite or a zeolite obtained by subjecting an H (proton) type zeolite to ion exchange with at least one noble metal selected from Pt, Pd, Rh, Ir and Ru, said catalyst and said adsorbent being carried together on a support or carried on respective supports with the catalyst downstream in the exhaust gas flow from the engine relative to the adsorbent,  
(2) starting the engine when cold, with the adsorbent and the catalyst in a cold state, and  
(3) starting the engine, heating said catalyst electrically, whereby unburnt hydrocarbons are first adsorbed from the cold exhaust gas by said adsorbent and thereafter desorbed from the adsorbent and reacted by said electrically heated catalyst."

"5. An apparatus for purification of automobile exhaust gas, including an adsorbent structure as defined in claim 1 or claim 2, when arranged in the exhaust gas system of an automobile."

"6. An apparatus for purification of automobile exhaust gas, including a catalyst for hydrocarbon conversion and an adsorbent structure as defined in claim 1 or claim 2, when arranged in the exhaust gas system of an automobile."

"7. An adsorbent for purification of automobile exhaust gas, comprising a high-silica zeolite characterized in that the zeolite has a Si/Al ratio of not less than 48 and is an H (proton) type zeolite or a

zeolite obtained by subjecting an H (proton) type zeolite to ion exchange with at least one noble metal selected from Pt, Pd, Rh, Ir and Ru, when arranged in the exhaust gas system of an automobile."

Claim 1 of the auxiliary request I for the designated states DE, FR and GB differs from claim 1 of the main request inter alia by the addition of a disclaimer, according to which "a zeolite obtained by mixing the zeolite with silica sol, drying and calcining" is excluded from the zeolites intended to be comprised by the claimed adsorbent structure.

VI. In support of his request, Appellant I relied essentially on the following submissions:

E3 disclosed an adsorbent structure (see page 3, lines 47, 48) comprising a honeycomb structure (see claim 10, and page 4, lines 41, 42), and an adsorbent coated on this honeycomb structure (see page 4, lines 32 to 39). The adsorbent comprised a zeolite obtained by subjecting an H type zeolite (see page 4, lines 30, 31) to ion exchange with at least one noble metal (see page 4, lines 41, 42) selected from Pt, Pd and Rh (see page 2, lines 46 to 48). Furthermore, the zeolite was a high silica zeolite having a Si/Al ratio between 5 and 100 (see page 3, lines 14, 15). Since the specific embodiments described on page 4, lines 25 to 52, and in tables 1 to 6 fell under the general disclosure described on page 2, line 43 to page 4, line 1, and since the middle of the range of the Si/Al ratio and the upper limit (100) was in the range of not less than 48, E3 disclosed an adsorbent structure comprising all features of claim 1 of the main request. Moreover, this

document additionally disclosed all features of claims 2, 5, 6 and 7. Therefore the subject-matter of these claims was not novel.

E7 was not intended to be introduced into the appeal proceedings. This document had only been cited to show that the S-115 zeolite cited in E4 and produced by Union Carbide was a zeolite having an extremely high Si/Al ratio. This was, however, well known by the skilled person.

VII. Appellant II disputed the views of Appellant I. His arguments can be summarized as follows:

The invention according to the patent in suit was restricted to an adsorbent comprising an H type zeolite having a specific Si/Al ratio. It was true that E3 disclosed, in particular in the examples described on page 4, an adsorbent structure having most of the features of claim 1 of the main request. This document however did not directly and unambiguously disclose an H type zeolite having a Si/Al ratio of at least 48. Even if the skilled person considered the Si/Al ratio of 5 - 100 described on page 2 of E3 which did not particularly refer to an H type zeolite, there was only a 50% chance of selecting a Si/Al ratio which fell within the range defined in claim 1. Since there was no direct and unambiguous instruction in E3 to select a Si/Al ratio of at least 48 for an H type zeolite, the subject-matter of the claims according to the main request was novel. With respect to claims 5, 6 and 7 this conclusion was additionally supported by the fact that E3 did not refer to an apparatus for purification of automobile gas, let alone to such an apparatus arranged in an exhaust gas system.

E7 was filed only four days before the oral proceedings. Hence, there was not enough time to seriously verify the teaching of this document. Consequently E7 should

not be introduced into the proceedings. Furthermore, since E7 was not a document of the manufacturer of the S-115 zeolite, and since S-115 might stand for a group of zeolites, E7 was not suitable for proving that this zeolite typically had a Si/Al ratio of not less than 48.

## **Reasons for the Decision**

1. The appeal is admissible
2. *Introduction of E7*

E7 was sent by fax from Appellant I to Appellant II on 23 June 2003, only four days before the oral proceedings. The Board agrees that this period was too short for Appellant II to seriously deal with E7, in particular to find out whether or not the Si/Al ratio of the zeolite S-115 described in this document was the only and correct Si/Al ratio of S-115. Therefore, under consideration of the given circumstances, and with respect to Article 114(2) EPC, the introduction of E7 into the appeal proceedings was not allowed.

3. *Novelty - Main request (Appellant II)*
  - 3.1 E3 discloses, in particular on page 4, lines 25 to 52, and in tables 4 to 6, an adsorbent structure comprising: a honeycomb structure (see page 4, lines 33 to 35) having a periphery and two ends, including a plurality of passages which are defined by partition walls and extend in an axial direction between the ends (typical embodiment of a honeycomb structure and therefore implicitly disclosed in E3); and an adsorbent for purification of automobile exhaust gas coated on the partition walls and comprising a zeolite (see page 4, lines 32 to 40), the zeolite being an H (proton) type zeolite obtained by subjecting an H



(proton) type zeolite (H-ZSM-5) to ion exchange with a noble metal selected from Pt, Pd and Rh (see page 4, lines 41 to 45, and tables 4 to 6).

The description on page 4, lines 25 to 52 and the tables 4 to 6 do not explicitly mention any Si/Al ratio of the zeolites presented in connection with preferred embodiments of the invention according to E3, covering thereby the complete range of existing Si/Al ratios. Nevertheless, it is obvious for the skilled person that these zeolites, inter alia the H type zeolite H-ZSM-5, due to its composition must have a specific Si/Al ratio. Furthermore, the skilled person has to consider the teaching of E3, according to which the  $\text{SiO}_2/\text{Al}_2\text{O}_3$  molar ratio of the zeolite used for the adsorbent preferably falls in the range from 10 to 200 (see page 3, lines 14, 15, and claims 3, 9, 15) which corresponds to a Si/Al ratio from 5 to 100.

In view of this specific situation, the question arises whether or not the skilled person would have seriously contemplated using in the adsorbent structure according to E3 an H type zeolite having a Si/Al ratio falling within the claimed range, or in other words a Si/Al ratio which falls in the range of overlap between E3 (either the complete range of all existing Si/Al ratios, or the preferred range from 5 to 100) and claim 1 of the main request (not less than 48), ie from 48 to 100.

E3 neither describes particular values or even more preferred sub-ranges within the Si/Al ratio range from 5 to 100, nor excludes any section of this range. Hence there is no reason which would have discouraged the skilled person from contemplating the use of a Si/Al ratio up to 100. On the contrary, since the whole range from 5 to 100 is already described as a preferred range in E3, the skilled person would have seriously contemplated using an H type zeolite having a Si/Al ratio from 5 to 100, ie also values higher than 48. The

skilled person would in particular have seriously contemplated the explicitly disclosed value of 100 as an appropriate preferred value within the teaching of E3, so that at least this value is not new.

3.2 The statement of Appellant II that there was only a 50% chance of selecting a Si/Al ratio from the range according to E3 which fell within the range of 48 to 100 may be correct. However, this finding is without relevance for the question of whether or not the skilled person would have seriously contemplated the selection of a Si/Al ratio within the range from 48 to 100, since the mathematical chance for selecting a specific value out of a range has nothing to do with the contemplation of a skilled person when using such a specific value. For the decision on whether or not a skilled person would use specific values of a certain range, it is only of interest whether there are reasons which could suggest or discourage such a use. In the present specific case, the Board cannot see any reason, why the skilled person would not seriously contemplate the use of a value of the range common to E3 and the patent in suit.

3.3 According to the case law of the Boards of Appeal, any prior-art disclosure is novelty destroying, if the subject-matter claimed can be inferred directly and unequivocally from that disclosure, including features which for the skilled person are implicit in what is explicitly disclosed (see Case Law of the Boards of Appeal of the European Patent Office, 4th edition 2001, English version, I.C.2.3, page 57). In the present case E3 explicitly discloses on page 4, lines 25 to 52, and in tables 4 to 6, an adsorbent structure having most features of claim 1 except the one according to which

the H-ZSM-5 zeolite has a Si/Al ratio of not less than 48. However, since the general teaching of E3 suggests the provision of zeolites having a preferred Si/Al ratio of 5 to 100, and since there is no reason which could hinder the skilled person from seriously contemplating the use of a Si/Al ratio in the upper portion of that range, ie a value near to the specifically disclosed value of 100, the combination of this feature with the remaining features of claim 1 is at least implicitly disclosed in E3. Therefore the Board does not share the view of Appellant II that E3 does not directly and unambiguously disclose an H type zeolite having a Si/Al ratio of at least 48.

- 3.4 The statement of Appellant II according to which E3 does not refer to an apparatus for purification of automobile gas arranged in an exhaust gas system is also not convincing. As already set out in the introductory portion of the description (see page 2, lines 6, 7) and in the introductory portion of the claims, E3 refers to an apparatus for purifying exhaust gases of an internal combustion engine. Since the skilled person knows that such an apparatus is (normally) arranged in an exhaust gas system, the Board has no doubt that E3 at least implicitly refers to an apparatus for purification of automobile gas arranged in an exhaust gas system. Therefore E3 also discloses all features of claims 5 and 7.

However, E3 does not refer to an apparatus for purification of automobile exhaust gas which comprises besides an adsorbent structure a separate catalyst for hydrocarbon conversion as described in claim 6.

3.5 With respect to the above findings, the subject-matter of independent claims 1, 5 and 7 of the main request lacks novelty, and the subject-matter of independent claim 6 is new.

Therefore the main request of the Appellant II is rejected.

4. *Suspension of the further proceedings*

4.1 By the decision T 507/99 the following point of law has been referred to the Enlarged Board of Appeal under Article 112(1(a) EPC (see OJ EPO, 2003, 182):

"1. Is an amendment to a claim by the introduction of a disclaimer unallowable under Article 123(2) EPC for the sole reason that neither the disclaimer nor the subject-matter excluded by it from the scope of the claim have a basis in the application as filed?

2. If the answer to question 1 is no, which criteria are to be applied in order to determine whether or not a disclaimer is allowable?

(a) ... ."

Moreover, by the decision T 451/99 the following point of law has been referred to the Enlarged Board of Appeal under Article 112(1)(a) EPC (see OJ EPO, 2003, 183):

"Is the introduction into a claim of a disclaimer not supported by the application as filed admissible, and therefore the claim allowable under Article 123(2) EPC, when the purpose of the disclaimer is to meet a lack-of-novelty objection pursuant to Article 54(3) EPC? If yes, what are the criteria to be applied in assessing the admissibility of the disclaimer?"

The cases set out above are pending before the Enlarged Board of Appeal as cases G 1/03 and G 2/03.

- 4.2 In the present case, claim 1 of the auxiliary request I (Appellant II) for the designated states DE, FR and GB comprises a disclaimer which in the light of the findings in section 3 above is obviously intended to meet a lack-of-novelty objection pursuant to Article 54(3) EPC. Therefore, the questions referred to the Enlarged Board of Appeal are the same as those which must be answered by this Board.

In order to ensure uniform application of the law as foreseen by Article 112(1) EPC and to comply with the spirit of Article 16 of the Rules of Procedure of the Boards of Appeal which presupposes an already existing decision of the Enlarged Board of Appeal, this Board considers it appropriate to hold its decision in abeyance so that the Enlarged Board's evaluation of the question before it will not be anticipated (see also T 166/84, OJ EPO 1984, 489).

## **Order**

### **For these reasons it is decided that:**

1. The decision under appeal is set aside.
2. The main request of Appellant II is rejected.

3. The proceedings are suspended either until the Enlarged Board of Appeal has taken a decision in cases G 1/03 and G 2/03 or until auxiliary requests without disclaimer are presented by Appellant II.

The Registrar:

The Chairman:

G. Magouliotis

C. Andries