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**Datasheet for the decision
of 5 June 2019**

Case Number: T 0201/17 - 3.3.05

Application Number: 12177705.6

Publication Number: 2517778

IPC: B01D53/94, B01J23/72,
B01J29/70, B01J29/85,
B01J23/745, B01J29/56

Language of the proceedings: EN

Title of invention:

TRANSITION METAL/AEI-ZEOLITE SCR CATALYST

Patent Proprietor:

JOHNSON MATTHEY PUBLIC LIMITED COMPANY

Former Opponent:

Haldor Topsoe A/S

Headword:

Cu/AEI-Zeolite/Johnson Matthey

Relevant legal provisions:

EPC Art. 76(1), 83, 56

Keyword:

Divisional application - added subject-matter (no)

Sufficiency of disclosure - (yes)

Inventive step - (yes)

Decisions cited:

Catchword:



Beschwerdekammern

Boards of Appeal

Chambres de recours

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Case Number: T 0201/17 - 3.3.05

D E C I S I O N
of Technical Board of Appeal 3.3.05
of 5 June 2019

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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
15 November 2016 concerning maintenance of the
European Patent No. 2517778 in amended form.**

Composition of the Board:

Chairman E. Bendl
Members: G. Glod
O. Loizou

Summary of Facts and Submissions

- I. The present appeal of the patent proprietor (appellant) lies from the interlocutory decision of the opposition division finding that the then fourth auxiliary request filed during oral proceedings before the opposition division met the requirements of the EPC.

The following documents cited in the impugned decision are of relevance here:

D1: US 5 958 370 A

D3: US 2005 0031514 A1

D4: US 5 024 981 A

D9: AEI, XP 055250625, 27 February 2007

URL: http://izasc.biw.kuleuven.be/fmi/xsl/IZA-SC/Atlas_pdf/AEI.pdf

- II. With its submission dated 8 August 2017, the former opponent submitted additional experimental data.
- III. By letter dated 15 January 2018, the appellant presented further data.
- IV. By letter dated 4 July 2018, the opponent withdrew its opposition and appeal.
- V. In a communication pursuant to Rule 100(2) EPC of 8 November 2018, the board was of the preliminary opinion that the then main request and the first to third auxiliary requests did not meet the requirements of Articles 76(1) and 56 EPC.
- VI. With its submissions of 12 February 2019, the appellant filed new fourth to eighth auxiliary requests.

- VII. In the communication pursuant to Article 15(1) RPBA, the board maintained its position on the then main request and the first to third auxiliary requests and indicated that the fourth auxiliary request appeared to be allowable.
- VIII. By letter dated 29 April 2019, the appellant made the fourth auxiliary request its main request.

The independent claims of the request are as follows:

"1. A zeolite catalyst coated on a monolith substrate for converting nitrogen oxides in a gas to nitrogen by contacting the nitrogen oxides with a nitrogenous reducing agent in the presence of the zeolite catalyst, which zeolite is a small pore zeolite containing a maximum ring size of eight tetrahedral atoms and having the AEI Framework Type Code and containing a total of from 0.01 to 20 weight percent of at least one transition metal, based on the total weight of the zeolite catalyst, wherein the at least one transition metal is copper."

"8. An exhaust system for a vehicular lean burn internal combustion engine, which system comprising a conduit for carrying a flowing exhaust gas, a source of nitrogenous reductant, a zeolite catalyst according to claims 1-5 or 7 disposed in a flow path of the exhaust gas and means for metering nitrogenous reductant into a flowing exhaust gas upstream of the zeolite catalyst."

"11. 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 zeolite catalyst according to any of claims 1 to 5."

Claims 1 to 7, 9, 10 and 12 relate to preferred embodiments.

- IX. The arguments of the former appellant-opponent that are still potentially relevant can be summarised as follows:

The combination of features present in claim 1 was not directly and unambiguously derivable from the parent application.

SSZ-39 was only obtainable in a very limited set of conditions, using specific raw materials. A research programme was needed to obtain the desired zeolite. The requirements of Article 83 EPC were not met.

D1 was not limited to a three-way catalyst and could be used as the closest prior art. D4 was also a possible starting point. The subject-matter of claim 1 was an obvious alternative to the Cu/ZSM-5 catalyst disclosed in D4.

- X. The appellant requested that the impugned decision be set aside and that the patent be maintained in amended form on the basis of the main request submitted on 29 April 2019 or, alternatively, the previous main request or one of the auxiliary requests 1 to 3, submitted with the grounds of appeal, or auxiliary requests 5 to 8, submitted with the letter of 12 February 2019.

Reasons for the Decision

Main request

1. Article 13(1) RPBA

The request was submitted on 12 February 2019. Its admission is at the board's discretion (Article 13(1) RPBA). The request is admitted into the appeal proceedings because it is a response to the board's objections and is allowable for the reasons set out below.

2. Article 76(1) EPC

The requirements of Article 76(1) EPC are considered to be fulfilled for the following reasons:

Claim 1 is based on the catalyst described in claim 1 of the parent application together with page 19, lines 25/26, and page 18, line 25, from which it is directly and unambiguously derivable that Cu is particularly preferred as a transition metal. Generally applicable teachings concerning the intended use of the catalyst can be found on page 1, lines 3 to 6, and concerning the amount of metal on page 18, line 30, of the parent application. A list of small pore zeolites is provided on page 9, lines 17 to 20, from which one type is chosen.

Claim 2 is based on claim 9 of the parent application; claim 3 on page 17, last line; claim 4 on Table 1 on page 10; claim 5 on page 6, lines 1 to 3; claim 6 on page 19, lines 26 to 30; and claim 7 on page 19, lines 17 to 19.

Claims 8 to 12 were not under debate before the opposition division.

3. Article 83 EPC

The former opponent only alleged that a research programme was needed to synthesise the claimed zeolite. The board sees no reason to deviate from the opposition division's conclusion since there is no evidence that the claimed zeolite could not be synthesised based on the teaching of D9, for example. In other words, the opposition division's reasoning provided in point 4.3 of the impugned decision has not been put aside.

4. Article 56 EPC

4.1 The invention relates to a zeolite catalyst for reducing nitrogen oxides to nitrogen with a nitrogenous reducing agent.

4.2 It is established case law that the closest prior art is normally a prior-art document disclosing the same purpose or aiming at the same objective as the claimed invention and having the most features in common with the claimed subject-matter. D4 is considered the closest prior art since it also relates to a method for the reduction of nitrogen oxides with ammonia using zeolite catalysts (column 1, lines 9 to 14). It claims a catalyst composition comprising a first catalyst and a second catalyst (claim 1). The proprietor accepted that Cu/ZSM-5 is disclosed in D4 (see item 30 of the statement setting out the grounds of appeal).

D1 relates to crystalline zeolite SSZ-39. It discloses that SSZ-39 may be used for the catalytic reduction of the oxides of nitrogen in a gas stream (column 13,

lines 11 and 12), but it does not disclose the reduction of nitrogen oxides with a nitrogenous reducing agent. Therefore, D1 is considered less suitable as the closest prior art.

- 4.3 The problem to be solved is to provide a catalyst that has good low temperature SCR (selective catalytic reduction) activity with low selectivity towards N₂O (paragraphs [0023] and [0034]).
- 4.4 The solution proposed is a catalyst according to claim 1 characterised in that it is a small pore zeolite having the AEI Framework Type Code.
- 4.5 The results, presented with the submissions of 15 January 2018 on page 11, although not conducted with a zeolite coated on a monolith substrate, show that the AEI zeolite has a lower selectivity towards N₂O than Beta and ZSM-5 zeolites. These data were submitted at a late stage, but the board admits them into the proceedings since they are considered to be a response to the decision and the data provided by the then opponent. The board has no reason to doubt that the same trend in the results would be obtained when the catalyst was coated on a monolith. Even if it cannot be concluded from the data provided by the appellant with its submission of 15 January 2018 and the then opponent on 8 August 2017 whether the low temperature SCR activity is improved, it is accepted that the low temperature SCR activity of Cu-AEI is as good as that of Cu-ZSM-5. Therefore, the problem has been successfully solved.
- 4.6 The solution is not obvious for the following reasons:
- D4 itself does not disclose AEI zeolites.

As indicated above, D1 is a very general document about zeolite SSZ-39 that presents a three-way catalyst as "one example" (column 13, line 18), but it does not explicitly mention the reduction of nitrogen oxides in the presence of a nitrogenous reducing agent. Consequently, there is no indication of the selectivity in such a process towards N_2 or N_2O . The solution to the posed problem is not taught in D1.

D3 relates to an emission treatment system having an oxidation catalyst upstream of a soot filter coated with a material effective in the SCR of nitrogen oxides by a reductant (paragraph [0001]). Copper exchanged beta zeolite is presented as the preferred catalyst (claims 14 and 16 and paragraph [0084]). However, D3 does not disclose AEI zeolites.

- 4.7 The subject-matter of claim 1 involves an inventive step.

- 4.8 Claims 2 to 12 directly or indirectly depend on claim 1, so the same conclusion applies. The requirements of Article 56 are fulfilled.

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 on the basis of the set of claims of the main request submitted with the letter dated 29 April 2019 and a description to be adapted.

The Registrar:

The Chairman:



C. Vodz

E. Bendl

Decision electronically authenticated