Internal distribution code:

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

Datasheet for the decision of 12 June 2023

Case Number: T 0228/22 - 3.3.05

Application Number: 17200920.1

Publication Number: 3300791

IPC: B01D53/94

Language of the proceedings: EN

Title of invention:
TRANSITION METAL/ZEOLITE SCR CATALYSTS

Patent Proprietor:
Johnson Matthey Public Limited Company

Opponent:
BASF Corporation

Headword:
SCR/Johnson Matthey

Relevant legal provisions:
RPBA 2020 Art. 12(2), 13(2), 11
EPC Art. 76(1), 111(1), 123(2)

Keyword:
Main request taken into account (yes)
Amendment after summons - fresh objection - taken into account (no)
Divisional application - added subject-matter (no)
Remittal - (yes)

Decisions cited:
T 2117/18, T 0710/15

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

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 0228/22 - 3.3.05

D E C I S I O N
of Technical Board of Appeal 3.3.05
of 12 June 2023

Appellant: (Patent Proprietor)	Johnson Matthey Public Limited Company 5th Floor 25, Farringdon Street London EC4A 4AB (GB)
Representative:	Boult Wade Tennant LLP Salisbury Square House 8 Salisbury Square London EC4Y 8AP (GB)
Respondent: (Opponent)	BASF Corporation 100 Park Avenue Florham Park, NJ 07932 (US)
Representative:	Altmann, Andreas Altmann Stößel Dick Patentanwälte PartG mbB Isartorplatz 1 80331 München (DE)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 13 December 2021 revoking European patent No. 3300791 pursuant to Article 101(3)(b) EPC.**

Composition of the Board:

Chairman	T. Burkhardt
Members:	S. Besselmann
	R. Winkelhofer

Summary of Facts and Submissions

I. This appeal is against the opposition division's decision to revoke European patent EP 3 300 791 B1. The patent in suit concerns transition metal/zeolite SCR catalysts.

II. The opposition division dealt with the ground for opposition pursuant to Article 100(c) EPC. It found that the patent as granted contained subject-matter which extended beyond the content of WO 2008/132452, the same also applying to auxiliary requests 1 to 13. Auxiliary request 14 was not admitted into the proceedings.

III. The international application published as WO 2008/132452 A2 corresponds to the earliest parent application (hereinafter "root application") of the divisional application underlying the patent in suit.

IV. In the grounds of appeal, the patent proprietor (appellant) defended the patent as granted and also maintained the auxiliary requests filed with the opposition division. In reply to the board's preliminary opinion, they renumbered and reordered their requests, auxiliary request 12 becoming the new main request.

V. Independent claims 1 and 9 of this main request read as follows:

1. *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 synthetic aluminosilicate small pore zeolite catalyst, wherein the synthetic aluminosilicate zeolite has a silica-to-alumina ratio (SAR) of from 8 to 150 and contains a maximum ring size of eight tetrahedral atoms and is the CHA Framework Type Code and contains at least one transition metal, which at least one transition metal consists of copper and
which catalyst is coated on a monolith substrate disposed in a flow path of the exhaust gas and means for metering the nitrogenous reductant from the source of nitrogenous reductant into a flowing exhaust gas upstream of the synthetic aluminosilicate small pore zeolite catalyst, wherein an oxidation catalyst comprising at least one platinum group metal for oxidising nitrogen monoxide to nitrogen dioxide is located upstream of the means for metering the nitrogenous reductant into a flowing exhaust gas,
wherein the CHA Framework Type Code synthetic aluminosilicate small-pore zeolite is SSZ-13.

9. *A method of converting nitrogen oxides in an exhaust gas derived from the combustion of fuel in a vehicular lean burn internal combustion engine to nitrogen by contacting the nitrogen oxides with a nitrogenous reducing agent in the presence of a synthetic aluminosilicate small pore zeolite catalyst,*
wherein the synthetic aluminosilicate zeolite has a silica-to-alumina ratio of from 8 to 150 and contains a maximum ring size of eight tetrahedral atoms and is the CHA Framework Type Code and contains at least one transition metal, which at least one transition metal consists of copper and which catalyst is coated on a monolith substrate,
wherein nitrogen monoxide in the exhaust gas is

oxidised to nitrogen dioxide using an oxidation catalyst comprising at least one platinum group metal located upstream of the synthetic aluminosilicate small pore zeolite catalyst and the resulting gas is then mixed with the nitrogenous reducing agent before the mixture is fed into the synthetic aluminosilicate small pore zeolite catalyst,
wherein the CHA Framework Type Code synthetic aluminosilicate small pore zeolite is SSZ-13.

Claims 2-8, 10 and 11 relate to particular embodiments.

VI. The opponent (respondent) presented, *inter alia*, objections under Articles 76(1) and 123(2) EPC. They also argued that the renumbered requests should not be taken into account.

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

The main request, when filed as auxiliary request 12, was not convergent with then higher ranking requests. Changing the order of the requests constituted an amendment to the appellant's case. This triggered new objections because it in particular led to a further lack of convergence and was detrimental to procedural economy.

The requirements of Articles 76(1) and 123(2) EPC were not met because numerous features taken from the description having different levels of preference had been combined, thus amounting to multiple arbitrary selections. This concerned in particular the selection of the transition metal, the framework type, the selection of SSZ-13 over SAPO-34, the silica-alumina ratio, the monolith substrate and the requirement that

the catalyst was coated on it. In claim 9, this additionally concerned the oxidation catalyst and the absence of the feature of claim 33 of the root application, specifying that a gas stream with a specific NO to NO_2 ratio is yielded. Method and system claims were not equivalent and had different scopes of protection. The basis for the system claim could only be found in system claims or the description. It was not permissible to rely on the examples.

Additionally, due to the omission of the feature "the zeolite catalyst is a small pore zeolite" in claim 1, the requirements of Article 76(1) EPC were also not met.

The dependent claims also violated Article 76(1) and Article 123(2) EPC. This objection had been presented in the reply to the appeal and had to be taken into account. The later submissions on this point merely served to refine and further develop the initial arguments. They were not an amendment to the respondent's case, in line with the Case Law of the Boards of Appeal of the EPO, 10th edn., 2022, V.A. 4.2.2m. These submissions were at most new arguments under a ground of opposition already validly raised and had to be considered, in line with T 710/15.

VIII. The appellant's arguments are reflected in the reasons for the decision.

IX. According to both parties, the case should be remitted for further prosecution if one of the requests met the requirements of Articles 76(1) and 123(2) EPC.

X. The appellant requests that the decision under appeal be set aside and amended such that the patent be

maintained on the basis of the main request, filed as auxiliary request 12 on 4 August 2021, or alternatively on the basis of auxiliary request 1, filed as auxiliary request 14 during oral proceedings before the opposition division, or on the basis of one of auxiliary requests 2-14 corresponding to the former main request and former auxiliary requests 1-11 and 13.

The respondent requests that the appeal be dismissed.

Reasons for the Decision

1. Consideration of the main request

1.1 The main request had been filed with the opposition division as auxiliary request 12. It was dealt with in the impugned decision (point II.3). The respondent does not argue that the opposition division's decision suffered from an error in the use of discretion. Auxiliary request 12 was then defended in the statement of grounds of appeal and thus forms part of these opposition appeal proceedings (Article 12(2) RBPA 2020).

1.2 In reply to the board's preliminary opinion, according to which the patent on the basis of auxiliary request 12 appeared to meet the requirements of Articles 76(1) and 123(2) EPC, the appellant had changed the ranking order of their requests and thus renumbered auxiliary request 12 as the main request.

1.3 The respondent was of the opinion that the newly numbered requests should be disregarded because changing the order of the requests constituted an amendment to the appellant's case. According to the

respondent, this change furthermore triggered new objections because it in particular led to a lack of convergence and was detrimental to procedural economy, since features of previously higher ranking requests would not be discussed and might well re-emerge at a later stage.

1.4 The changed ranking order might result in the current auxiliary requests not being convergent with the main request and being unsuitable for addressing objections concerning the main request. However, while this might affect dealing with the auxiliary requests, it is irrelevant to the question of whether the main request is to be taken into account.

The appellant chose to make the most promising request, i.e. the request for which the board's preliminary opinion was positive, the main request. The board does not see how this would be detrimental to procedural economy. On the contrary, by focusing the discussion, it in fact contributes to procedural economy (in this regard see also T 218/20, point 3.3 of the reasons).

1.5 For these reasons, even if the changed ranking order as a whole were an amendment to the appellant's case and thus subject to the requirements of Article 13(2) RPBA 2020, this would not affect the discussion of the main request at issue. The main request is to be taken into account.

2. Consideration of the objections against the dependent claims of the main request

2.1 In their reply to the appeal, the respondent invoked Articles 123(2) and 76(1) EPC against not only the

independent but also the dependent claims (points III. 1.3.7 and III.2.3 of the reply, dealing with the patent as granted). However, only the features of the independent claims were discussed, and no reasoning specific to the dependent claims was provided. In a later submission of 1 March 2023 (point III.11), the respondent stated that the dependent claims contravened Articles 76(1) and 123(2) EPC for the same reasons brought forward against the independent claims of the patent as granted.

2.2 Only in reply to the board's preliminary opinion under Article 15(1) RPBA 2020 of 10 March 2023, and after summons to oral proceedings had been issued on 6 December 2022, did the respondent for the first time make somewhat detailed remarks regarding features of several dependent claims of the then auxiliary request 12 (respondent's submission of 29 March 2023, in particular point III.2.7 thereof).

The respondent was of the opinion that these remarks merely aimed at illustrating, refining and further developing their arguments presented with the reply to the appeal, and at countering the appellant's arguments, and therefore did not amount to an amendment of their case, in line with the Case Law of the Boards of Appeal of the EPO, 10th edn., 2022, V.A.4.2.2m. The respondent furthermore referred to T 710/15 to support their assertion that no new facts or evidence were being filed, but at most new arguments under a ground of opposition already validly raised.

2.3 However, in this case the respondent's submissions of 29 March 2023 and later cannot be regarded as a mere further development or refinement of an existing objection concerning the dependent claims because no

substantiated objection specifically concerning the dependent claims existed in the first place; it was neither presented in the reply to the appeal, nor dealt with in the impugned decision. An objection becomes effective - and is thus to be considered to have been validly submitted for the first time - only when sufficient substantiation is provided (T 2117/18, Reasons 2.2.17).

In T 710/15, cited by the respondent, the board dealt with the opposition division's discretion under Article 114(2) EPC and found that the new objection under Article 123(2) EPC merely introduced a new argument under a ground of opposition already validly raised (Reasons 1.4.1); it concerned the same "amendment" raising the issue of an intermediate generalisation which had already been mentioned in the notice of opposition. T 710/15 is thus not comparable with the case at issue.

2.4 The respondent was furthermore of the opinion that the objection regarding dependent claim 3 of the main request had been substantiated in the reply to the appeal because the additional feature of this claim (relating to "total copper metal") was the same as in claim 4 as granted, which corresponded to the feature introduced in claim 1 of then auxiliary requests 2 and 3. According to the respondent, claim 3 had thus been indirectly discussed in the reply when dealing with these auxiliary requests (in point IV.2.2 of the reply).

2.5 However, while the reply addresses each of the then auxiliary requests, their discussion as a whole is unspecific and mainly refers to the arguments presented for the claims as granted, in some cases adding that a

feature had again been taken from the description which was not a most preferred feature and was of a different rank to the other numerous features taken from the description. In this case, the mere fact that auxiliary requests 2 and 3 were addressed does not automatically constitute an objection against claim 3 at issue. This claim (of the then auxiliary request 12) was not directly addressed and furthermore is not identical to claim 1 in auxiliary requests 2 and 3 because of the additional presence of the feature of claim 2 as granted (namely the feature relating to "SSZ-13").

2.6 For these reasons, the objection against the dependent claims is an amendment of the respondent's case and its consideration is governed by Article 13(2) RPBA 2020. It shall thus, in principle, not be taken into account unless there are exceptional circumstances, which have been justified with cogent reasons.

2.7 No such exceptional circumstances can be identified. In particular, the fact that the preliminary opinion concurred with the appellant's view does not amount to exceptional circumstances. Furthermore, the board's preliminary opinion which indicated that the respondent had not specifically addressed the dependent claims does not constitute an invitation to make further submissions.

2.8 The objections under Articles 123(2) and 76(1) EPC concerning dependent claims 2 to 8, 10 and 11 are therefore not taken into account.

3. Main request: Articles 76(1) and 123(2) EPC

3.1 The patent in suit is based on a divisional application, which - via intermediate divisional applications - derived from the above-mentioned root application (point III.). References will be made to the indicated international publication which, as was not contested, corresponds to the root application as originally filed.

One of the requirements of Article 76(1) EPC is thus that the claimed subject-matter is directly and unambiguously derivable from this root application.

3.2 Claim 1

3.2.1 Claim 1 at issue relates to an exhaust system for a vehicular lean burn combustion engine and is based on claim 38 of the root application. In comparison with the latter, amendments were made to further specify the zeolite catalyst and additionally to specify the presence, type and location of an oxidation catalyst in the system.

3.2.2 The zeolite catalyst is specified as a synthetic aluminosilicate small pore zeolite catalyst, wherein the synthetic aluminosilicate zeolite has a silica-to-alumina ratio (SAR) of from 8 to 150, is of CHA Framework Type Code and contains at least one transition metal, which at least one transition metal consists of copper. The catalyst is coated on a monolith substrate. The CHA Framework Type Code synthetic aluminosilicate small pore zeolite is SSZ-13.

3.2.3 The root application indicates Cu/SSZ-13 - among others - as a preferred zeolite (page 19, lines 5 and 8).

Examples 2 and 10 to 12 also relate to a Cu/SSZ-13 zeolite, pointing to it being one of the preferred zeolite catalysts. For them to be a pointer, it is not decisive that a specific Cu/SSZ-13 (having a specific copper content and obtained by a specific preparation method) is prepared, nor that catalytic properties are tested without providing an entire exhaust system. It is also irrelevant in this regard that the examples do not expressly state the SARs.

Cu/SSZ-13 is thus specifically disclosed, and only a single selection within a disclosure of several preferred zeolites (additionally including Cu/Nu-3, Cu/SAPO-34, Fe/SAPO-34 and Fe/SSZ-13, see page 19, first paragraph) is needed.

"Cu/SSZ-13" constitutes a specific embodiment of a synthetic aluminosilicate small pore zeolite containing a maximum ring size of eight tetrahedral atoms and is the CHA Framework Type Code. The CHA zeolite is three dimensional. The formula Cu/SSZ-13 shows that the transition metal consists of copper. These features are thus implicit in the reference to Cu/SSZ-13 and do not involve separate selections.

According to the root application, the zeolite catalysts for use in the present invention are preferably coated on a suitable substrate monolith (page 6, last sentence). Coating on a suitable monolith substrate is additionally disclosed on page 19, lines 25-26. Even though alternatives to coating on a monolith are also disclosed (page 19, lines 16-23), coating is preferred (page 6, last sentence), as indicated. Furthermore, it is incorrect to argue that the "monolith substrate" had been selected from among

the monolith substrate and a filter substrate as alternatives because the term "monolith substrate" encompasses a filter substrate (page 19, lines 16-20; page 21, line 14) and the indicated passages mention coating on a monolith substrate. It follows that no further selection was involved.

This general teaching applies to Cu/SSZ-13, which is described as a catalyst for use in *the present invention* (page 19, first paragraph). This reference to the *present invention* includes both the method of converting nitrogen oxides in a gas to nitrogen (claim 1 and page 1, lines 3-6 of the root application) and the exhaust system (claim 38 and the paragraph bridging pages 20 and 21 of the root application).

3.2.4 The method aspect and the system aspect of the disclosed invention are equivalent, in that the exhaust system has to be understood to allow the method to be carried out. This does not only derive from the root application as a whole, but in particular from the explicit statement that *the small pore transition metal-containing zeolites for use in the exhaust system aspect of the present invention include any for use in the method according to the invention as described above* (page 21, lines 8 to 10 of the root application). In this case, a disclosure concerning a feature of the method may thus also apply to the same feature in the system. Under these circumstances, it is irrelevant that a method claim has a different scope of protection than a system claim.

3.2.5 Claim 1 additionally specifies that the "zeolite has a silica-to-alumina ratio (SAR) of from 8 to 150". This range is based on the general disclosure in the paragraph bridging pages 17 and 18 of the root

application, where it is disclosed that "[s]mall pore aluminosilicate zeolites for use in the present invention can have a silica-to-alumina ratio (SAR) of from 2 to 300, optionally 4 to 200 and preferably 8 to 150". The claimed range of 8 to 150 is the most preferred range.

This disclosure applies to SSZ-13 because it is a small pore aluminosilicate zeolite. There is no reason why this would not be the case, and in particular no reason why the indicated range would be *prima facie* incompatible with SSZ-13 zeolite.

The board does not agree with the respondent that the further disclosure in the indicated paragraph would raise doubts as to this conclusion, or would provide an alternative to adjusting the SAR. It is described that higher SAR ratios are preferred for thermal stability, but may negatively affect transition metal exchange, and that a balance is struck between these two properties. These sentences thus do not provide an alternative to the indicated range of the SAR, but rather explain the disclosed range.

There is also no disclosure that the selection of the SAR would depend on the transition metal chosen.

The SAR is not presented as an alternative to other features either. The aluminosilicate zeolite must necessarily have an SAR. While the SAR is not specified in the examples, the skilled person would read them in the light of the general disclosure regarding the SAR, in particular as the application links the low activity of natural chabazite compared with other isotypes such as SSZ-13 (in part) to the low SAR of the former (page 6, penultimate paragraph, referring to Example 13). The

natural chabazites tested in Example 13 have SARs of 4 and 7. As indicated, SSZ-13 is described as having a higher SAR, thus pointing to the preferred range of 8 to 150 which is the only range that precludes the SARs of the tested natural chabazites.

3.2.6 Accordingly, the synthetic aluminosilicate small pore zeolite catalyst of the claimed exhaust system, the catalyst having all the features specified in the claim in combination, is directly and unambiguously derivable from the root application.

3.2.7 The exhaust system is disclosed in claim 38 of the root application, as indicated. The additional presence of *an oxidation catalyst comprising at least one platinum group metal for oxidising nitrogen monoxide to nitrogen dioxide is located upstream of the means for metering the nitrogenous reductant into a flowing exhaust gas*, is disclosed in claims 45 and 46 of the root application. Claim 46 is dependent on claim 45 which refers back to claim 38.

3.2.8 For these reasons, the respondent's objections that the claimed subject-matter was freshly created by multiple arbitrary selections, or established a fresh relationship between features having different levels of preference, are not convincing.

3.2.9 The respondent also observed that the feature according to which "the zeolite catalyst *is* a small pore zeolite..." [emphasis added] of claim 38 of the root application was not present in claim 1 at issue. In their opinion, this resulted in a further difference between the catalyst definition in the claim at issue and the claim on which it was based. According to the respondent, this difference meant that the catalyst was

no longer limited to being (solely) the specified zeolite, in violation of Article 76(1) EPC.

Irrespective of whether this objection, which was raised for the first time during the oral proceedings before the board, is taken into account under Article 13(2) RPBA 2020, it is not convincing.

The indication that the zeolite catalyst *is* a small pore zeolite in claim 38 of the root application has the consequence that the feature "a zeolite catalyst containing at least one transition metal" signifies that the small pore zeolite contains the at least one transition metal.

However, claim 1 at issue conveys the same meaning that the small pore zeolite (i.e. SSZ-13 in that claim) contains the at least one transition metal (i.e. Cu). The indication "wherein *the* synthetic aluminosilicate zeolite" [emphasis added] in the claim at issue refers back to "a synthetic aluminosilicate small pore zeolite catalyst" as its antecedent. For these reasons, and in view of the otherwise open wording of claim 38 of the root application (system *comprising;* zeolite catalyst *containing*), the absence of the word "is" in the claim at issue does not infringe Article 76(1) EPC.

The question of whether this may affect how "the total weight of the synthesis aluminosilicate catalyst" is calculated concerns dependent claim 3 and would again constitute a fresh objection against a dependent claim, which is not taken into account for the reasons indicated (see point 2. above).

3.2.10 In summary, the subject-matter of claim 1 is directly and unambiguously derivable from the root application as filed.

3.3 Claim 9

3.3.1 Claim 9 relates to a method of converting nitrogen oxides to nitrogen and is based on claim 1 of the root application, seen in conjunction with the first paragraph on page 1. Compared with claim 1 of the root application, it is furthermore specified that "*nitrogen monoxide in the exhaust gas is oxidised to nitrogen dioxide using an oxidation catalyst [...] located upstream of the [...] zeolite catalyst and the resulting gas is then mixed with the nitrogenous reducing agent before the mixture is fed into the [...] zeolite catalyst*". This feature was disclosed in claim 33 of the root application in conjunction with the additional requirement that the oxidation catalyst be adapted to yield a gas stream entering the zeolite catalyst having a ratio of NO to NO_2 of from about 4:1 to about 1:3 by volume. The respondent objected to the absence of this requirement in the claim at issue. However, it may be taken from the disclosure on page 22 (lines 8-10) of the root application that this feature is optional. This also derives from the corresponding system claims 45 and 46 of the root application, which do not contain this feature either, there being a further claim relating to it (claim 47). Claims 45 to 47 can be consulted because there is no doubt that the oxidation catalyst of the exhaust system in these claims equates to the oxidation catalyst in method claim 33.

3.3.2 Claim 9 at issue also specifies that the oxidation catalyst comprises at least one platinum group metal,

based on the disclosure on page 22, line 17 or claim 46. This does not involve a selection because no alternative oxidation catalysts are disclosed.

3.3.3 Claim 9 additionally defines the small pore zeolite catalyst. The definition is the same as in system claim 1 and therefore the same considerations apply. As indicated (point 3.2.4), there is an equivalence between the method and the system, and the same small pore transition metal-containing zeolites are used in both (page 21, lines 8 to 10 of the root application).

3.3.4 In summary, the subject-matter of claim 9 is also directly and unambiguously derivable from the root application as filed.

3.4 The divisional application underlying the patent in suit derives from the root application via intermediate divisional applications (published as EP2786796 and EP3278863). No separate objections under Article 76(1) EPC were raised concerning the basis of the claimed subject-matter in these intermediate divisional applications.

Moreover, no separate objections under Article 123(2) EPC were raised concerning the basis of the claimed subject-matter in the underlying (divisional) application as originally filed.

The appellant indicated that the description of the divisional application was largely the same, save for the numbered items added from page 23, line 14 - page 28, line 20, which correspond to the claims of the root application as filed. This also applies to the intermediate divisional applications.

3.5 For these reasons, the requirements of Articles 76(1) EPC and Article 123(2) EPC are met.

4. Article 111(1) EPC

4.1 Since the primary object of the appeal proceedings was to review the decision under appeal in a judicial manner (Article 12(2) RPBA 2020), the circumstances of this case, in which the opposition division has not decided on the other grounds for opposition, qualify as a special reason for remittal under Article 11 RPBA 2020, as requested by both parties.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the Opposition Division for further prosecution.

The Registrar: The Chair:

C. Vodz T. Burkhardt

Decision electronically authenticated