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Datasheet for the decision of 25 August 2009

Case Number: T 1322/07 - 3.3.05

Application Number: 01129490.7

Publication Number: 1214967

IPC: B01D 53/94

Language of the proceedings: EN

Title of invention:
Exhaust gas purifying catalyst

Applicants:
ICT Co., Ltd.
International Catalyst Technology, Inc.

Opponent:
-

Headword:
Exhaust catalyst/ICT

Relevant legal provisions:
EPC Art. 54(1)(2), 84, 111(1), 123(2)

Relevant legal provisions (EPC 1973):
-

Keyword:
"Remittal for further prosecution"

Decisions cited:
-

Catchword:
-

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Case Number: T 1322/07 - 3.3.05

D E C I S I O N
of the Technical Board of Appeal 3.3.05
of 25 August 2009

Appellants: ICT Co, Ltd.
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 6 November 2006 refusing European application No. 01129490.7 pursuant to Article 97(1) EPC 1973.**

Composition of the Board:

Chairman: G. Raths
Members: J.-M. Schwaller
H. Preglau

Summary of Facts and Submissions

I. This appeal lies from the decision of the examining division refusing European patent application No. 01 129 490.7.

II. In the contested decision, the examining division held the respective claim 1 of the four requests then on file as lacking novelty over the disclosure of document

D1: US 4 927 799.

Claim 1 of the main request read as follows:

"*1. A catalyst for purification exhaust gases from an internal combustion engine characterized by comprising a complex of oxides of cerium and a solid solution oxide containing Zr and Ce, wherein the complex is obtainable by depositing oxides of cerium on oxide of solid solution containing zirconium and cerium*".

Claim 1 of the first auxiliary request was distinguished from above claim 1 in that the catalyst was further defined as having "*a molar ratio of Ce:Zr in the solid solution oxide in the range of 0.05 to 0.49:0.95 to 0.51*".

Claim 1 of the second auxiliary request was distinguished from claim 1 of the main request in that the catalyst was further defined in that "*a powder of the solid solution indicated only diffraction pattern for zirconium dioxide but substantially no diffraction pattern for cerium dioxide by means of X-ray diffraction method*".

Claim 1 of the third auxiliary request was distinguished from claim 1 of the second auxiliary request in that the catalyst was further defined as having "*a molar ratio of Ce:Zr in the solid solution oxide in the range of 0.05 to 0.49:0.95 to 0.51*".

III. With the grounds of appeal, the patentee (hereinafter "the appellant") submitted six different sets of claims entitled main request and first to fifth auxiliary request, respectively.

IV. In a communication under Rule 100(2) EPC, the board objected to the claims then on file under Article 84 EPC. In particular, it was necessary to specify the expression "*complex of oxides of cerium and a solid solution oxide containing Zr and Ce*" used in the claims, in particular to avoid any misunderstanding of the term "complex", which in the present application had manifestly a meaning different from the one generally accepted in chemistry, namely a coordination compound.

V. Under cover of a letter dated 16 July 2009, the appellant submitted four new sets of amended claims entitled main request and first to third auxiliary request, respectively.

Claim 1 of the main request reads as follows:

"*1. A catalyst for purification exhaust gases from an internal combustion engine characterized by comprising a complex of oxides of cerium and a solid solution oxide containing Zr and Ce, wherein*

– the oxides of cerium are deposited on the solid solution oxide;
– the deposition ratio of the oxides of cerium to the solid solution oxide is 3 to 50:100 parts by weight;
– the complex is represented by the formula 1:

CeOx/Zr-Ce-O (1)

wherein the term Zr-Ce-O is an oxide of the solid solution exhibiting zirconium dioxide structure by XRD, and the term CeOx is the oxides of cerium deposited onto the solid solution oxide;
– the molar ratio of Ce:Zr in the solid solution oxide is in the range of 0.05 to 0.49:0.95 to 0.51."

VI. The appellant requests that the decision under appeal be set aside and that a patent be granted on the basis of the claims according to one of the requests filed with letter dated 16 July 2009.

Reasons for the Decision

1. Main request

1.1 Claim 1 - Amendments

Amended claim 1 of the main request finds its support in claims 1 and 2 as well as in the passages at page 5, lines 6 to 8; page 6, lines 11 to 14 and page 7, lines 15 to 23, of the application as filed and so meets the requirements of Article 123(2) EPC.

1.2 Claim 1 - Clarity

1.2.1 In comparison to the claims that the board objected to under Article 84 EPC, the present claim 1 further defines the "complex of oxides of cerium and a solid solution oxide containing Zr and Ce" as being represented by:

– the formula: CeOx/Zr-Ce-O, with

Zr-Ce-O representing a zirconium-cerium oxide solid solution exhibiting zirconium dioxide structure by XRD, and CeOx representing the oxides of cerium deposited onto the solid solution.

Claim 1 further defines the above complex as having:

– a deposition ratio of the oxides of cerium to the solid solution oxide in the range 3 to 50: 100 parts by weight, and

– a molar ratio of Ce:Zr in the solid solution oxide (in the range of 0.05 to 0.49: 0.95 to 0.51).

1.2.2 The board observes that the above amendments to claim 1 make in particular clear that the complex represented by the formula CeOx/Zr-Ce-O does not have the structure of a coordination compound. The board is therefore satisfied that the amendments proposed overcome the clarity objection raised in the communication under Rule 100(2) EPC.

1.3 Claim 1 - Novelty over D1

1.3.1 Document D1, that the examining division considered as novelty-destroying (see item I), discloses (claims 1, 2) a catalyst for the purification of exhaust gases, comprising a support substrate, a catalyst carrier layer carried on said support substrate and catalyst ingredients carried thereon, wherein said catalyst carrier layer comprises oxides of cerium and zirconium and a member selected from the group consisting of active alumina, zirconia and titanium oxide, at least 5% by weight of each said oxide of cerium and zirconium being present in the form of a composite oxide and/or solid solution, and said composite oxide and/or solid solution being formed by adding a cerium salt and a zirconium salt in the form of an aqueous solution on said member and burning at a temperature not less than 600°C.

1.3.2 In the decision, the examining division held that D1 disclosed the formation of a "complex of oxides of cerium (and zirconium) and a solid solution oxide containing Zr and Ce" in view of the preparation method disclosed in the passage at column 4, line 50 to column 5, line 9, which reads: "*The composite oxide and/or solid solution having oxides of cerium and zirconium can be formed in a catalyst carrier layer by moistening the catalyst carrier layer with two kinds of aqueous solution of cerium chloride and zirconate simultaneously or separately and burning at temperatures not less than 600°C. Also, the composite oxide and/or solid solution can be formed by mixing the cerium and the zirconium with active alumina powder when the catalyst carrier layer is formed, and burning*

at temperatures not less than 800°C. In this place, at least one of the cerium and the zirconium is in the oxide form. If the burning temperature is less than the above mentioned value, the formation of the composite oxide and/or solid solution becomes difficult and therefore the growth of cerium oxide particles is facilitated. It is preferred that cerium oxide and zirconium oxide are present in the form of composite oxide and/or solid solution on the whole, however, the growth of cerium oxide particles can be suppressed effectively even if at least a part of them are present in the form of composite oxide and/or solid solution. The cerium oxide and zirconium oxide may be present within a catalyst carrier layer or carried on the surface of the carrier layer. If they are present on the surface of the carrier layer, the catalyst property is improved remarkably since the contact with exhaust gases is facilitated and the oxygen storing capability is fully demonstrated."

1.3.3 The board observes that even if one cannot exclude that a "complex of oxides of cerium and a solid solution oxide containing Zr and Ce" might be produced by the above preparation method, neither the above passage, nor the remaining parts of D1 disclose directly and unambiguously that the deposition ratio of the oxides of cerium to the solid solution oxide would lie in the range 3 to 50: 100 parts by weight.

The board furthermore notes that contrary to claim 1 which requires that zirconium must be in the majority in the solid solution (Ce/Zr molar ratio in the range of 0.05 to 0.49: **0.95 to 0.51**), D1 discloses that the Zr/Ce atomic ratio in the composite oxide and/**or** solid

solution be preferably in the range **5**:95 to 80:20 (column 5, lines 11 to 14), so D1 does also not directly and unambiguously disclose the zirconium-cerium oxide solid solution exhibiting zirconium dioxide structure by XRD as presently defined in claim 1.

1.3.4 For the above reasons, the subject-matter of independent claim 1 (and of dependent claims 2 to 13) of the main request is novel over the disclosure of document D1.

2. Remittal

Since the contested decision was only concerned with the novelty issue over document D1 and did not address in particular the inventive step issue, the board considers it appropriate to exercise its power conferred by Article 111(1) EPC to remit the case for further prosecution.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the first instance for further prosecution on the basis of the set of claims 1 to 13 according to the main request filed with letter of 16 July 2009.

The Registrar: The Chairman:

C. Vodz G. Raths