

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

UMICORE AG & CO. KG,
Petitioner,

v.

BASF CORPORATION,
Patent Owner.

Case IPR2015-01125
Patent 7,601,662

Before CHRISTOPHER L. CRUMBLEY, JO-ANNE M. KOKOSKI, and
JEFFREY W. ABRAHAM, *Administrative Patent Judges*.

ABRAHAM, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318 and 37 C.F.R. § 42.73

I. INTRODUCTION

Umicore AG & Co. KG (“Petitioner”) filed a Petition seeking *inter partes* review of claims 1–24, 30, and 32–50 of U.S. Patent No. 7,601,662 B2 (Ex. 1101, “the ’662 patent”), as amended by *Ex parte* Reexamination Certificate No. US 7,601,662 C1 (“Reexam. Cert.”). Paper 1 (“Pet.”). BASF Corporation (“Patent Owner”) filed a Preliminary Response to the Petition. Paper 8. On October 29, 2015, we instituted an *inter partes* review of claims 1, 2, 5, 6, 12–24, 30, and 32–38 as discussed below. Paper 9 (“Dec. on Inst.”).

After institution, Patent Owner filed a Patent Owner Response (Paper 25, “PO Resp.”), and Petitioner filed a Reply (Paper 37, “Reply”). An oral hearing was held on July 28, 2016, and a transcript of the hearing has been entered into the record of the proceeding as Paper 52 (“Tr.”).

We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons that follow, we determine that Petitioner has shown by a preponderance of the evidence that claims 1, 2, 5, 6, 12–24, 30, and 32–38 are unpatentable.

II. BACKGROUND

A. *Related Proceedings*

Petitioner identifies pending *inter partes* review Case IPR2015-01121, also pertaining to the ’662 patent. Pet. 1. In addition to IPR2015-01121, Patent Owner identifies pending *inter partes* review Cases IPR2015-01123 and IPR2015-01124, pertaining to U.S. Patent No. 8,404,203 B2, which issued from a divisional of the application that issued as the ’662 patent. Paper 6, 2.

B. The '662 Patent

The '662 patent states that “synthetic and natural Zeolites and their use in promoting certain reactions, including the selective reduction of nitrogen oxides with ammonia in the presence of oxygen, are well known in the art,” and that “[m]etal-promoted Zeolite catalysts including, among others, iron-promoted and copper-promoted Zeolite catalysts, for the selective catalytic reduction of nitrogen oxides with ammonia are known.” Ex. 1101, 1:26–33.

The '662 patent discloses catalysts that comprise zeolites having a CHA crystal structure and include copper, which may be part of an exhaust gas treatment system. *Id.* at 1:55–61. According to the '662 patent, “novel copper chabazite catalysts are provided which exhibit improved NH₃ SCR of NO_x.” *Id.* at 1:64–66. Several embodiments described in the '662 patent depict a catalyst comprising a zeolite having the CHA crystal structure, a specific mole ratio of silica to alumina (e.g., greater than about 15), and a specific atomic ratio of copper to aluminum (e.g., greater than about 0.25). *Id.* at 4:24–29.¹ The '662 patent teaches that the catalyst compositions can be disposed on a substrate, which usually comprises a honeycomb structure. *Id.* at 6:55–59. According to the Specification, the CuCHA zeolite catalysts of the '662 patent are said to have increased hydrothermal stability (i.e., greater stability when subjected to thermal aging) as compared to other Cu-zeolite catalysts. *Id.* at 5:1–16, 5:49–52.

¹ For purposes of this decision, we follow the parties' convention of using “SAR” to refer to the mole ratio of silica to alumina, and “Cu/Al ratio” to refer to the atomic ratio of copper to aluminum required in the claims.

C. Illustrative Claim

Claim 1 is the only independent claim challenged, and is reproduced below:

1. A catalyst comprising:

an aluminosilicate zeolite having the CHA crystal structure and a mole ratio of silica to alumina from about 15 to about 150 and an atomic ratio of copper to aluminum from about 0.25 to about 1, the catalyst effective to promote the reaction of ammonia with nitrogen oxides to form nitrogen and H₂O selectively.

Ex. 1101, Reexam. Cert. 1:56–2:3 (annotations and emphasis omitted).

D. References

Petitioner relies on the following references:

Maeshima et al., US 4,046,888, issued September 6, 1977 (“Maeshima,” Ex. 1102).

Breck, deceased et al., US 4,503,023, issued March 5, 1985 (“Breck,” Ex. 1103).

Patchett et al., US 2006/0039843 A1, published February 23, 2006 (“Patchett,” Ex. 1105).

Dedecek, et al., *Siting of the Cu⁺ ions in dehydrated ion exchanged synthetic and natural chabasites: a Cu⁺ photoluminescence study*, 32 MICROPOROUS AND MESOPOROUS MATERIALS 63, (1999) (“Dedecek,” Ex. 1107).

E. Reviewed Grounds of Patentability

The Board instituted trial to review the patentability of the challenged claims on the following grounds:

References	Statutory Basis	Claims Challenged
Maeshima and Breck	§ 103	1, 2, 5, 6, and 30
Maeshima, Breck, and Patchett	§ 103	12–24 and 32–38
Dedecek and Breck	§ 103	1, 2, 5, 6, and 30
Dedecek, Breck, and Patchett	§ 103	12–24 and 32–38

F. Level of Ordinary Skill in the Art

Petitioner’s declarant, Dr. Lercher, testifies that a person of ordinary skill in the art “would have at least a Master’s degree in chemistry or a related discipline, and have knowledge of the structure and chemistry of molecular sieves like zeolites, including factors that impact their stability and activity.” Ex. 1108 (“Lercher Declaration”) ¶ 66. Patent Owner’s declarant, Dr. Tsapatsis, stated that he agrees with the level of ordinary skill in the art advanced by Dr. Lercher. Ex. 2018 (“Tsapatsis Declaration”) ¶ 22.

We credit the testimony provided by the declarants for both parties and hold that one of skill in the art would possess at least a Master’s degree in chemistry or a related discipline, and have knowledge of the structure and chemistry of molecular sieves like zeolites, including factors that impact their stability and activity. This level of ordinary skill is reflected not only by the information presented by the parties, but also by the prior art of record. *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (the prior art itself can reflect the appropriate level of ordinary skill in the art).

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