

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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UMICORE AG & CO. KG,  
Petitioner,

v.

BASF CORPORATION,  
Patent Owner.

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Case IPR2015-01121  
Patent 7,601,662

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

ABRAHAM, *Administrative Patent Judge*.

DECISION  
Institution of *Inter Partes* Review  
37 C.F.R. § 42.108

## 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. 1001, “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 Patent Owner preliminary response to the Petition. Paper 7 (“Prelim. Resp.”). Applying the standard set forth in 35 U.S.C. § 314(a), which requires demonstration of a reasonable likelihood that Petitioner would prevail with respect to at least one challenged claim, we institute an *inter partes* review of claims 1–8, 12–24, 30, and 32–50 as discussed below.

Our findings of fact and conclusions of law are based on the record developed thus far, prior to the Patent Owner’s Response. This is not a final decision as to the patentability of any challenged claim. Any final decision will be based on the full record developed during trial.

## II. BACKGROUND

### A. *Related Proceedings*

Petitioner identifies pending *inter partes* review petition No. IPR2015-01125, also pertaining to the ’662 patent. Pet. 1. In addition to IPR2015-01125, Patent Owner identifies pending *inter partes* review petition Nos. IPR2015-01123 and -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 5, 2.

*B. The '662 Patent*

The '662 patent, titled “Copper CHA Zeolite Catalysts,” originally issued on October 13, 2009, with an *ex parte* reexamination certificate issuing on June 7, 2013. The '662 patent discloses catalysts that comprise zeolites having a CHA crystal structure, which may be part of an exhaust gas treatment system. Ex. 1001, 1:55–61. 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.<sup>1</sup> 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.

The '662 patent explains that

As is known in the art, to reduce the emissions of nitrogen oxides from flue and exhaust gases, ammonia is added to the gaseous stream containing the nitrogen oxides and the gaseous stream is then contacted with a suitable catalyst at elevated temperatures in order to catalyze the reduction of nitrogen oxides with ammonia.

...

Metal-promoted zeolites have been used to promote the reaction of ammonia with nitrogen oxides to form nitrogen and H<sub>2</sub>O selectively over the competing reaction of oxygen and ammonia. The catalyzed reaction of ammonia and nitrogen oxides is therefore sometimes referred to as the selective catalytic reduction (“SCR”) of nitrogen oxides or, as sometimes herein, simply as the “SCR process”.

*Id.* at 8:14–19 and 38–44.

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<sup>1</sup> 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.

According to the Specification, the CuCHA zeolite catalysts disclosed therein “yield improved activity in the selective catalytic reduction of NO<sub>x</sub> with ammonia.” *Id.* at 5:4–6. Additionally, 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.

*Illustrative Claim*

Petitioner challenges claims 1–24, 30, and 32–50 of the ’662 patent. 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 H<sub>2</sub>O selectively.

Ex. 1001, Reexam. Cert. 1:56–2:3 (annotations and emphasis omitted).

*C. References*

Petitioner relies on the following references:

Zones et al., US 6,709,644 B2, issued March 23, 2004 (“Zones,” Ex. 1004).

Maeshima et al., US 4,046,888, issued September 6, 1977 (“Maeshima,” Ex. 1002).

Patchett et al., US 2006/0039843 A1, published February 23, 2006 (“Patchett,” Ex. 1005).

*D. The Asserted Grounds*

Petitioner asserts the following grounds of unpatentability:

| References                    | Statutory Basis | Claims Challenged |
|-------------------------------|-----------------|-------------------|
| Zones and Maeshima            | § 103           | 1–11 and 30       |
| Zones, Maeshima, and Patchett | § 103           | 12–24 and 32–50   |

Petitioner also relies on declarations from Dr. Johannes A. Lercher (Ex. 1008) and Dr. Frank-Walter Schütze (Ex. 1015).

III. ANALYSIS

*A. Claim Construction*

In an *inter partes* review, claim terms in an unexpired patent are interpreted according to their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b); *In re Cuozzo Speed Techs., LLC*, 793 F.3d 1268, 1276–79 (Fed. Cir. 2015). We determine that no express claim construction is required for purposes of this decision.<sup>2</sup>

*B. References*

*1. Zones*

Zones discloses aluminosilicate zeolites having the CHA crystal structure. Ex. 1004, 1:7–23 and Abstract (referring specifically to the chabazite structure). Zones teaches that its zeolite may have an SAR greater than 10. *Id.* at 1:7–10. Zones further discloses that its zeolite may be prepared from a mixture of reactants having SAR values ranging from 20 to

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<sup>2</sup> We note that the parties agree that zeolites having the CHA crystal structure are also known as “chabazite.” Pet. 5; Prelim. Resp. 13.

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