

Patent Owner's Demonstratives

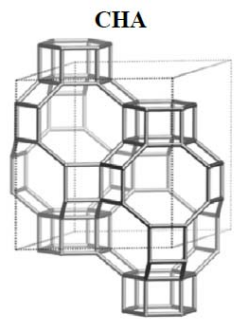
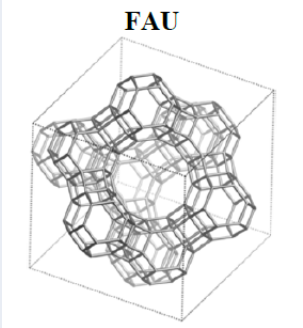
IPR2015-01121, -23, -24, -25

Umicore AG & CO. KG v. BASF Corporation
(Oral Hearing – July 28, 2016)

■ Metal-Exchanged Zeolite Catalysts

Zeolite Overview

- Crystalline framework materials that contain pores of a molecular size.
- Framework types are cataloged by the IZA.

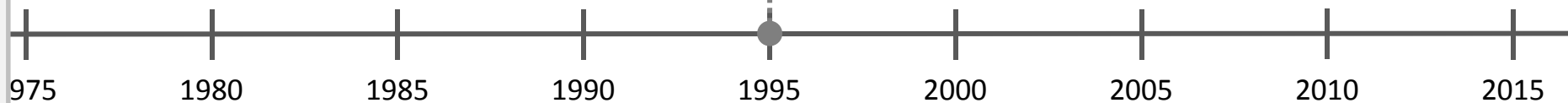
Framework	Materials	Pore Size	Ring Structure
 <p>CHA</p>	chabazite (natural) SSZ-13 SSZ-62	3.8 Angstroms	8-ring
 <p>FAU</p>	faujasite (natural) zeolite-Y	7.4 Angstroms	12-ring

Ex. 2018, ¶¶56-61

Zeolite SCR Catalysts: Pre-662 Patent

“Indeed, several unresolved problems limit the outlook for successful use of zeolites in automotive converters: (i) hydrothermal stability, (ii) sensitivity to poisoning....A low hydrothermal stability, in particular, is the more critical weakness of copper-containing zeolites.”

Ex. 2012.005 (1995)

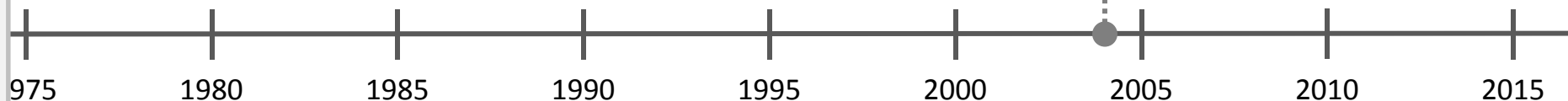


Zeolite SCR Catalysts: Pre-662 Patent

“The catalyst was tested for durability in both wet and sulphur containing gases, but even water had a negative long-term effect on the catalyst and its applicability must be regarded as rather low. **One can be quite pessimistic about the use of zeolites for several reasons:**

- (i) The catalyst types have been tested in the SCR reaction since the eighties without a commercial breakthrough.
- (ii) Zeolites have been extensively tested in the so-called HC-SCR reaction with insufficiently long-term stability....

Ex. 2026.006 (2004)



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