

Mechanism of Phase Transition Caused by Water Absorption in FAPO-34

Hiroyuki Imura, Toshio Akai, Masanori Yamazaki, Hiromu Watanabe, Takahiko Takewaki, Hiroyuki Kakiuchi, *Mitsubishi Chemical Group Science and Technology Research Center, Inc. 1000 Kamoshida-cho, Aoba-ku, Yokohama, Japan.* E-mail: imura.hiroyuki@mp.m-kagaku.co.jp

It was made clear that the phase transition mechanism caused by the water absorption in FAPO-34 using the single-crystal X-ray (SCX) analysis and EXAFS Fourier transform spectra analysis.

FAPO-34 is known as the one of the Chabazite type zeolite. [1] The crystals of FAPO-34 including organic template in the framework (**as-made**) were obtained by hydrothermal synthesis method. To utilize as the water absorption material, the **as-made** crystals were baked in some temperature conditions to remove the organic template. The **as-made** crystals baked at high temperature (**HT**) caused phase transition, but the one baked at low temperature (**LT**) kept the structure after the water absorption.

As the results of SCX and EXAFS analysis, it was made clear that the specific water coordination to Fe on the framework causes the phase transition of **HT**. SCX analysis showed the direct coordination of the water to Al and Fe on the framework and the structural skew of the framework caused by the specific water coordination to Fe of **HT**. EXAFS analysis showed that Fe of **LT** is covered by something else other than water.

[1] Ristic A., Tusar N.N., Arcon I., Thibault-Starzyk F., Hanzel D., Czyzniewska J., Kaucic V., *Micropor. Mesopor. Mater.*, 2002, **56**, 303-315.

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