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## **LETTER**

### **Reactive Al-O-Al sites in a natural zeolite: Triple-quantum oxygen-17 nuclear magnetic resonance**

**JONATHAN F. STEBBINS,\* PEIDONG ZHAO, SUNG KEUN LEE, AND XING CHENG**

Department of Geological and Environmental Sciences, Stanford University, Stanford, California 94305-2115, U.S.A.

#### **ABSTRACT**

In framework aluminosilicate materials (e.g., feldspars, zeolites and many others), it is generally assumed that  $\text{AlO}_4$  tetrahedra do not share corners, i.e., that Al-O-Al oxygen sites are avoided when stoichiometry permits. This assumption plays a key role in models of thermodynamic properties and of reaction kinetics. We present a new approach to directly test this assumption, based on  $^{17}\text{O}$  triple-quantum magic-angle spinning nuclear magnetic resonance (3QMAS NMR). We show that thermodynamically significant concentrations of Al-O-Al sites can be observed in a naturally occurring zeolite (stilbite), and that these sites react faster with  $\text{H}_2\text{O}$  vapor than do Si-O-Si and Si-O-Al sites.