
Study of the Nature of Acid Sites of Montmorillonites Pillared with Aluminium and Oligosilsesquioxane Complex Cations. 1. Brönsted Acidity

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Abstract: Two samples, obtained by pillaring a Wyoming montmorillonite with hydroxy aluminium and oligosilsesquioxane cations, were studied by stepwise thermal desorption of ammonia and by highly sensitive diffuse reflectance IR-spectroscopy. For both clays, the adsorption of ammonia shows a total number of acid sites equal to 0.35 meq/g, with acid strengths comparable to that of HY zeolites. By IR reflectance spectroscopy, Brönsted acid sites with an acid strength comparable to that of bridging hydroxyls in zeolites were found in Al samples but not on Si-montmorillonites. These sites were characterized by an overtone band at 7100 cm^{-1} and an activity for ethylene oligomerization at 300 K.

Key Words: Brönsted acidity • Diffuse reflectance IR-spectroscopy • Montmorillonites • Pillared clays

Clays and Clay Minerals; August 1994 v. 42; no. 4; p. 421-427; DOI: [10.1346/CCMN.1994.0420407](https://doi.org/10.1346/CCMN.1994.0420407)

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