
Condensation of Olefins on Clays. Gas-Solid Systems. Part I: Gravimetric Methods

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Abstract: The adsorption-condensation of olefins was studied on 7 adsorbents: 2 commercial clays, a natural clay and its protonated form, γ -alumina and porous and nonporous silicas. These adsorbents were characterized by X-ray diffraction (XRD), chemical analysis, thermogravimetric analysis (TGA), differential thermal analysis (DTA) and determination of specific surface area measurement by the BET method. The experiments were carried out gravimetrically, in gas- or vapor-solid systems, at 25 ° C and on adsorbents dried at 120 ° C. Adsorption-condensation of olefins are fast processes, diffusion controlled. Alumina and silicas adsorb olefins and paraffins only reversibly, but are unable to condense olefins. The water polarized by the counterions is the source of Brønsted acid sites. When the gas phase is evacuated or swept with inert gas, the condensation terminates. On clays, paraffins are reversibly adsorbed but no condensation was observed.

Key Words: Adsorption • Clays • Condensation • Olefins • Oligomerization • Paraffins

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