
Acid Activation of a Ferrous Saponite (Griffithite): Physico-Chemical Characterization and Surface Area of the Products Obtained

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Abstract: A ferrous saponite (griffithite) from Griffith Park (California, USA) was treated with solutions of HCl (0.62, 1.25 and 2.5% by weight) at 25° C for 2, 6, 24 and 48 hours. The resulting solids were characterized by XRD, FT-IR spectroscopy, thermal analyses, SEM, TEM and nitrogen adsorption isotherms at 77 K, showing the destruction of silicate structure by the treatments. The free silica generated by these treatments was digested and determined in all samples. Several samples had specific surface areas up to 250 m²/g, with maximum values which are 10 times higher than the surface area of natural saponite (35 m²/g). A sudden decrease in specific surface areas was observed when free silica was digested, which indicates that free silica makes a very important contribution to the surface area of leached samples.

Key Words: Acid activation • Ferrous saponite • Free silica • Surface area

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