

Synthesis and characterization of zeolite 4A-type desiccant from kaolin

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ABSTRACT

Natural kaolin, from Fujian province in China, was used as raw material to synthesize zeolite 4A powder under low-temperature hydrothermal treatment in alkali solution. Optimization studies on various reaction parameters were conducted. With the addition of an inorganic binder (montmorillonite), the as-prepared powder was shaped into spheres for desiccant application in industrial fields. Zeolite 4A powder was characterized by X-ray diffraction (XRD) and scanning electron microscopy (SEM) and the obtained powder was a cubic phase with high crystallinity. The water sorption capacity (WSC) and final compression strength (FCS) of zeolite 4A desiccant were studied. Higher crystallinity of zeolite 4A powder led to the higher WSC of zeolite desiccant. The observed WSC and FCS of 21.0% and 44.8 *N*, respectively, confirmed the potential application of zeolite 4A for water sorption.

Keywords: Zeolite 4A, desiccant, kaolin, water sorption capacity (WSC), final compression strength (FCS)