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Determination of Some of the Physicochemical Properties of Fine Alumina Powders Prepared by Emulsion Evaporation

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Abstract: In order to prepare fine alumina powders, an emulsion was prepared under optimum conditions. The emulsion was examined by optical microscopy and the prepared fine alumina powders were characterised by electron microscopy. The particles were formed of porous spheres and their sizes were between 1 and 10 \μm. The powder samples were sintered by varying the temperature between 700 and 1600°C. The adsorption and desorption of nitrogen on these samples were investigated. By using the adsorption data, the specific surface areas were calculated according to different procedures and the correlation between them was discussed. The specific micropore and mesopore volumes were calculated from the desorption data. Some kinetic and thermodynamic estimations about the intra-particle sintering were made according to the variation of the specific micropore-mesopore volumes as a function of the sintering temperature.

Key Words: Alumina powder, calcination, pore volume, sintering, surface area, thermal analysis.

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