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Abstract
In this study, the high surface area powders were synthesized by aluminium sec- butylate (ASB), boehmite and silica as the raw materials, respectively. When used ASB as the raw maerial, the various amount of different acids was added to synthesized the products. The shorter fiber (30-40nm in length) and spherical particle (10nm in diameter) were formed in the case by using actectic acid as the catalysis. If phosphoric acid was adopted, the formed powder was a 50-60nm in length fiber. Increasing the calcination temperature to 1200℃, the powder grow rapidly as it phase- transfered to α-alumina. But if adding phosphoric acid as the catalysis, the phase transformation of α-alumina was retarded to 1400℃.The retardation of phase transformation of alumina may is not important as the ratio of P/Al below than 0.01. IF P/Al ratio is higher than 0.057, the specific area of the powder was reduced.

In the case that boehmite was the raw material, increasing the phosphoric acid concentration would induce the increase of the amount of fiber. The product can be maintain at the high surface area after the long aging time(100 h) at 1000 ℃.

In the study of the high surface area silica, sodium silicate was adopted to form form silica xerogel with the different amount butanol in ambient drying. According to the experimental results, the product has a small surface area and small pore size diameter as it dried directly. Increasing the amount of buatanol, the surface area is increased and then decreased. The pore size was in 4.5～6 nm as the volume ratio of butanol to silicate <1. However, the pore diameter was in 12~17 nm as the volume ratio of butanol to silicate >1. The pore volume of the product was increased by increasing the volume ratio of butanol to silicate until to reach a maximum value and then was not increased by increasing the volume ratio of butanol to silicate. The result shows butanol can control the pore size and pore volume of the xerogel in the ambient pressure.
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