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Synthesis of aluminate porous microbeads through emulsion method from concentrated colloidal dispersions

Inorganic porous microbeads, with nanometer-scale pores and high specific surface area, are expected to be used in catalysis, sensing, and so on ¹⁾. There have been reports on the synthesis of silica microbeads with diameters of 0.2 to 2 μm and with various microstructures ²⁾. However, since it is difficult to control the reaction in other systems, there have been only a limited number of reports on the production of other inorganic microbeads. In this study, we aimed to synthesize aluminate porous microbeads by using concentrated dispersion of aluminum hydroxide nanoparticles.

Hydrophilic alcoholic liquid containing aluminum hydroxide nanoparticles were dispersed in oil to form a water-in-oil emulsion. Then, the nanoparticles were destabilized in the droplets by gradually transferring alcohol from hydrophilic to hydrophobic phases. Figure 1 shows an SEM image of the prepared aluminate microbeads. Aluminate microbeads with diameters of 2 to 8 μm were formed. The present synthesis method of microbeads rely only on the particle concentration and solvent composition of dispersion. Therefore, it is expected be applicable not only to aluminates but also to other metal systems.

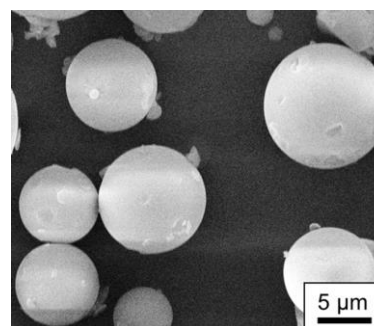


Fig. 1 SEM image of aluminate microbeads.

[References]

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