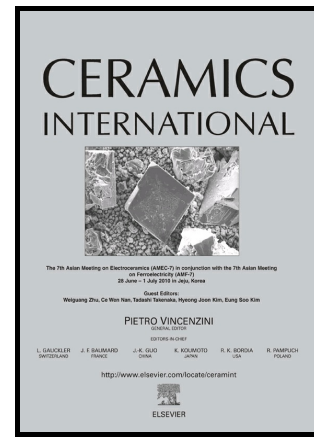


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Sujith Vijayan, Praveen Wilson, K. Prabhakaran



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Alumina foam microspheres by emulsion drop-casting in aqueous ammonium chloride solution

Sujith Vijayan, Praveen Wilson and K. Prabhakaran

Department of Chemistry, Indian Institute of Space Science and Technology,

Thiruvananthapuram- 695 547, India.

A facile method for the preparation of alumina foam microspheres from hydrogenated vegetable oil-in-aqueous alumina slurry (**HVO-in-AAS**) emulsions is reported. The HVO-in-AAS emulsions drop-cast in cold aqueous NH_4Cl solution undergo fast gelation due to the freezing of HVO, physical cross-linking of carrageenan gelling agent and coagulation by NH_4Cl . Emulsions of HVO to AAS volume ratios of 1.5 to 2.5 prepared from 10 and 20 vol.% AAS are used for drop-casting. Microspheres with sphericity close to 1 are obtained by drop-casting in 5 wt% aqueous NH_4Cl solution at -3°C . The well-defined interconnected cellular structure observed in the core of the sintered alumina foam microspheres is distorted towards the surface due to emulsion destabilization by the NH_4Cl . The porosity and cell size of the sintered alumina foam microspheres are independent of drop-casting bath conditions but depend on the emulsion composition. The microspheres have diameter, open pore volume and average cell sizes in the ranges of 2.38 to 2.49 μm , 1.22 to 2.42 cm^3/g and 15.66 to 6.87 μm , respectively.

Keywords: Alumina; foam microsphere; processing; drop-casting; coagulation

*Corresponding author. Tel. +91-471-2112048. E-mail: kp2952002@gmail.com
(K.Prabhakaran)

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