

Synthesis and Sulfonation of Styrene-Dimethacrylate Copolymers

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Abstract

Crosslinked gels are polymeric materials which have important applications, being used as ion exchange resin and catalyst support. In this study, styrene-dimethacrylate (Sty-DMA) resins were produced through suspension copolymerization. The process was carried out with two different crosslinkers: Ethylene Glycol Dimethacrylate (EGDMA) and Triethylene Glycol Dimethacrylate (TEGDMA) at 80°C in presence of benzoyl peroxide as initiator and toluene / heptane as porogen. The produced resins were sulfonated with sulfuric acid 98% at 70°C and the ion exchange capacity was determined. The main objective of this work was to verify the effect of crosslinker type on ion exchange capacity of the produced sulfonated resins, which will be applied as catalysts in further studies. High viscosity was observed in all experiments, mainly in runs with TEGDMA, which has higher molecular weight than EGDMA. It was verified an autoacceleration effect around 200 min of reaction, which was observed in all runs. A delay in gel point was detected when less crosslinker is added to the reaction, as expected. After the sulfonation process, resins made with TEGDMA presented higher ion exchange capacities when compared with resins made with EGDMA, which can be attributed to lower mass transfer resistance caused by a crosslinker with longer chain (TEGDMA).