

Synthesis of GMA/EDMA uniform pores monolith using melt blown polypropylene nanofibers templates

ABSTRACT

Glycidyl methacrylate/ethyl dimethacrylate (GMA/EDMA) monoliths consisting of pores induced by polypropylene nanofibers (PPNF) were developed. For creating these pores, templating technique was used where the PPNF act as a template. The PPNF were fabricated using a melt blowing technique at various process operations of polymer flowrate, air pressure and die-to-collector distance at ranges of 15 to 30 Hz, 0.15 to 0.3 MPa and 0.20 to 0.6 m respectively designed using a response surface methodology (RSM). Subsequently, a monolith solution was synthesis using the polymerization of GMA and EDMA, with azobisisobutyronitrile (AIBN) as initiator and cyclohexanol as porogen. The PPNF and GMA/EDMA monoliths were characterized using SEM and melting point instrument. The findings show, PPNF fiber diameter and melting points were in the range of 5 to 14 μ m and 120 to 130°C respectively. RSM analysis suggests that air pressure and die-to-collector distance could be an important factor for PPNF final diameter. Morphology studies demonstrate that GMA/EDMA monolith have been successfully acquired mesoporous structure and creating uniform pores by PPNF template produce at 22.5 Hz, 0.22 MPa and 0.40 m. As a conclusion, the PPNF can be proposed as a template to prepare monolith having uniform pores.