

Synthesis and characterization of inorganic microfiltration membrane through geopolymerization

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ABSTRACT

An inorganic microfiltration membrane has been synthesized by the hydrothermal method at a curing temperature of 90°C for 15 h through geo-polymerization technique using kaolinite material found in Azakhel Matani, Khyber Pakhtunkhwa, Pakistan. The metakaolin was obtained from the kaolinite material through calcination process at 700°C. XRF analysis of the thermally activated material revealed the presence of Si and Al in the ratio of 2.97. Geopolymer gel $\text{Na}_2\text{O}-3\text{SiO}_2-\text{Al}_2\text{O}_3$ was prepared by separate mixing of metakaolin with alkaline activator with the molar ratio of 2.5. The higher compressive strength of 62 MPa was achieved with the applied pressure of 46.55 MPa keeping Na_2SiO_3 to NaOH of 4.3 and 18 M concentrations.

Keywords: Geopolymerization; Inorganic membrane; Microfiltration; Kaolin; Metakaolin; Compressive strength; Hydrothermal treatment.

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