12

Title:
Development Of Polyvinylidene Fluoride (Pvdf) – Silica Aerogel (Sa) Composite As Evaporation Suppression Geo-Membrane For Fresh Water Reservoir

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Authors:
Amran, R.,
Yajid, M.A.M.,
Nuha Awang, nuha.awang@unikl.edu.my

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Abstract:
Polyvinylidene fluoride (PVDF) membrane was synthesized using dimethylformamide (DMF) solvent then prepared by phase inversion casting. The properties of PVDF have been enhanced by adding 10 wt.% of aerogel. The aerogel undergoes surface modifying using 30 wt.% of trimethylsilyl chlorosilane (TMCS). Membrane microstructure had been characterized by Fourier-transform infrared spectroscopy (FTIR) and scanning electron microscope (SEM). The samples had been undergone hydrophobicity test to characterized the psychochemical properties and for mechanical properties had been characterized by tensile test. SEM results for silica aerogel shows its multi porous properties. While SEM results for PVDF membrane shows silica aerogel is well scattered in the membrane. Results also showed that contact angle of PVDF membrane has increased about 36 % and the hydrophobicity effect due to silylated has displayed by FTIR. FTIR result is highlight that crystalline conformation of the chain from 849 cm-1 wavelength. The tensile strength of membrane increased about 14.71 % from 1.45 MPa to 1.70 MPa for PVDF 10 wt.% and PVDF 10 wt.% with silica aerogel (with silylating TMCS 30 wt.%) respectively. It can be concluded that by adding optimum amount of silica aerogel will enhance PVDF membrane properties.