

Effects of PVP and PEG on the morphological structure, hydrophilicity and mechanical properties of PSF/NH₂-SiO₂ composite membranes

Monday 21 May 2018 18:30 (15 minutes)

Abstract

This research studied the effects of PVP and PEG on morphology, hydrophilicity and mechanical properties of the PSF/NH₂-SiO₂ composite membranes. To study the chemical and physical properties, pure polysulfone (PSF) and nanocomposite PSF/NH₂-SiO₂ membranes were prepared. PVP and PEG at different loading were incorporated into the matrix of PSF membranes. Phase inversion technique was employed to forming of membrane. Composition and temperature of coagulation medium were controlled. The characteristics of prepared membranes was analyzed by using various analytical techniques. Hydrophilicity of membrane surface was determined through the measurement of water contact angle. Morphological structure, pore size and pore size distribution were studied through SEM image combined with computer software, Carnoy 2.0®. While tailoring of functional groups and mechanical properties were evaluated by FTIR-ATR and DMTA techniques, respectively. The results showed that introducing of PVP and PEG affect to the pore structure, pore size distribution and hydrophilic properties of PSF/NH₂-SiO₂ composite membranes. Result from DMTA revealed that modulus and mechanical strength of membrane sample was modified by incorporation of PVP and PEG. Glass transition temperature (T_g) of the prepared membranes slightly increased. As can be seen from the experimental results, it was confirmed that PVP and PEG affected to chemical and physical properties of PSF/NH₂-SiO₂ membranes.

Keywords: Composite membrane; Morphological structure; Hydrophilicity; PVP; PEG

Author: Ms NISARAT, C'sai (Department of Physics, Faculty of Science and Technology, Phetchabun Rajabhat University, 83 M.11 Sadiang sub-district, Muang, Phetchabun 67000, Thailand)

Co-author: Dr YUENYAO, Chalad (Department of Physics, Faculty of Science and Technology)

Presenters: Dr YUENYAO, Chalad (Department of Physics, Faculty of Science and Technology); Ms NISARAT, C'sai (Department of Physics, Faculty of Science and Technology, Phetchabun Rajabhat University, 83 M.11 Sadiang sub-district, Muang, Phetchabun 67000, Thailand)

Session Classification: A05: Nanoscale and Surface (Poster)

Track Classification: Surface, Interface and Thin Film