

Title:

Impact of exfoliated structure on the performance of electrospun SPEEK/cloisite nanocomposite membranes as proton exchange membranes for direct methanol fuel cell application.

Journal:

Journal of Environmental Chemical Engineering, Volume 9, Issue 4, August 2021.

Document Type:

Article

Authors:

Awang, N.,
Yajid, M.A.M.,
Jaafar, J.

Full text link:

Publisher : <https://www.sciencedirect.com/science/article/abs/pii/S2213343721002967>

Scopus preview:

<https://www.scopus.com/record/display.uri?eid=2-s2.0-85096875312&doi=10.1016%2Fj.jclepro.2020.124931&origin=inward&txGid=c03ff16ed523ef0fabb175a43114d4dd>

Abstract:

One of the key issues in the DMFC framework is methanol crossover. Surface modification is a promising approach to problem solving. A SPEEK/cloisite nanocomposite membrane exfoliated by electrospun is developed in this research. The membrane is prepared by immersing electrospun SPEEK/cloisite fibers mats in the SPEEK polymer matrix, which is half-solidated. The research addresses the effect of exfoliated morphology on the productivity of membranes. Compared to other sampling membranes like Nafion® 117, SP/e-spunCL15 with a completely exfoliated configuration has the best efficiency with a current density of 7.73 mAcm⁻² and a power density of 1.18 mWcm⁻². Improved morphological, dimensional change properties and performance assign a well dispersed cloisite15A induced by the electrospinning technique to the membranes more effective for direct methanol fuel cell applications.