



Cellulose based composite as membrane for chromium(III) removal

Thanatchaporn Kasempong², Chiravoot Pechyen^{1*} and Sarute Ummartyotin^{1*}

¹*Advanced Functional Polymeric Materials Research Group, Faculty of Science and Technology, Thammasat University, Patumtani, 12120, Thailand*

²*Materials Research Center, in collaboration with HORIBA Scientific and Thammasat University, Patumtani, 12120, Thailand*

*email: sarute.ummartyotin@gmail.com and chiravoot.p@gmail.com

Bacterial cellulose and polyethylene glycol was successfully designed as a composite membrane. The existence of polyethylene glycol was inserted into the porous structure of bacterial cellulose network as observed by Scanning electron microscope. The H-bond was formed between the hydroxyl group of both bacterial cellulose and polyethylene glycol unit. The composite membrane presented the thermal stability up to 300°C. The zeta potential revealed that composite membrane exhibits the electric charge of -40 mV in water. Frequency dependence on dielectric properties also presented its ability of polarization. Preliminary experiment on chromium (III) adsorption of composite membrane was observed. The uptake was stability after 4 hours. The experiment on membrane adsorption was promised us as an excellent adsorbent material in hazardous waste.

Keyword: Ion-exchange membrane; Bacterial cellulose; Polyethylene glycol; Chromium