Xiaobo Dong
Department of Chemical and Material Engineering, University of Kentucky, KY
177 F. Paul Anderson Tower xiaobodongmax@hotmail.com

Title: Investigation of environmentally friendly solvents for casting of water treatment membranes

Abstract: Membrane technology has been proven to be effective in recent years due to its benefits in membrane water treatment technology. Immersion precipitation is a conventional method to fabricate porous polymeric membranes. In this method, a dope solution is prepared by dissolving the polymer in a solvent, such as DMSO, DMF, and NMP. A membrane is then formed by the precipitation of the dope polymer in an anti-solvent bath, such as water. However, most of currently used solvents are volatile and toxic to the environment. Their disposal after use and the residue in the system has potential to cause damage to the environment. The aim of this study is to investigate ‘green solvents’ to cast membranes in order to minimize the environmental impacts. Polymer dope solutions will be prepared using several environmentally friendly solvents focusing on the polymer chemistry and thermodynamics of mixing. The membranes will be casted and characterized for their performance, and then compared with traditional membranes. Furthermore, the economic feasibility will also be considered. As a conclusion, this study will aim at making an environmentally friendly membrane with high performance in water treatment.