**Filtration Performance and Biofouling Resistance of Cellulose Acetate membrane with silver nanoparticles**

Biofouling is detrimental to water filtration processes and decreases the durability of membranes. Therefore, membranes, that are resistant to the accumulation of microorganisms, are a necessity for water purification. Using two different methods (coating and phase inversion), Cellulose Acetate (CA) and Poly(Vinyl Alcohol) (PVA) were used to fabricate membranes. Membranes were engineered with silver to increase the rejection of foulants and inhibit bacterial growth. PVA was utilized to fabricate composite membranes because it is a well-known hydrophilic surface modifier. The phase inversion method, the casting solution consisted of 20% (w/w) polymer (CA or PVA/CA) and two different solvent 80% (w/w) N-Methyl 2-Pyrrolidone (NMP) or 80% (w/w) Dimethyl Sulfoxide. Of the 20% (w/w) polymer concentration, different PVA concentrations were compared: 2% (w/w) 5% (w/w) and 10% (w/w). Membranes with reduced silver efficiently eradicated the growth of *E.coli* over a 5-hour time span pending *E.coli* colony concentration. SEM micrographs indicate the difference in pore morphology between the two membrane fabrication methods and the dispersion of silver particles on membrane’s surface. EDS & XPS confirms the presence of silver on membrane surface and sublayer. As an indirect measure of metal attachment, AAS results indicate that membranes irradiated with UV increases the amount of silver attached to the membrane, thus improving its antifouling capabilities. Phase inversion composite membranes saw an increase in equilibrium solution content, an increase in flux, and, as expected, a decrease in rejection with continued increase in PVA concentration, and decreased the growth of *E.coli* over a 3 hour time span. Comparing the two methods, membranes using the hybrid method yielded higher antimicrobial properties, while membranes fabricated via phase inversion has higher membrane performance data (flux and rejection).

Dr. Audie K. Thompson, Research Assistant Professor of chemical engineering in the lab of Dr. Felecia Nave at Prairie View A&M University. She serves as the Program Co-coordinator and research mentor for the PVAMU REU/REH program and a faculty research advisor for the LSAMP Undergraduate Research Program. She was recognized by the Thurgood Marshall College Fund on behalf of the Department of Defense for her work as a co-principal investigator on the project: PVAMU REU in Membrane Separation. She is serving as Co-PI of an NSF Grant S-STEM, Engineering Scholars Program: Fostering the Next Generation of STEM Leaders. She is the co-founder and co-editor of PURSUE, an undergraduate research journal housed at PVAMU. Her commitment to undergraduate research has also led to the development of the Bagheera Scholars Program (formerly Panther Scholars) which allows graduate students and undergraduates to lead research pods on campus. This program increases undergraduate research opportunities while simultaneously allows the leaders to gain managing experience. Dr. Thompson’s research focuses on the modification of surface chemistry to achieve selective separation using functionally specified membranes for water filtration and biological applications including separations, drug delivery and biosensors. She is responsible for managing the laboratory, teaching courses and training undergraduate and graduate students.