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## Cellulose acetate based Complexation- NF membranes for the removal of Pb (II) from waste water

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This study investigates the removal of Pb (II) using polymer matrix membranes, Cellulose acetate / Vinyl triethoxysilane (VTES) modified graphene oxide (GO) and Gum Arabic (GuA) membranes. These complexation-NF membranes were successfully synthesized via dissolution casting method for better transport phenomenon. The varied concentrations of GuA were induced in the polymer matrix membrane. The prepared membranes M-GuA2 - M-GuA10 were characterized by Fourier transform infrared spectroscopy (FTIR), scanning electron microscope (SEM), transmission electron microscope (TEM), atomic force microscope (AFM) and Bio-fouling test. Thermal stability of all the membranes was determined by thermogravimetric analysis (TGA) under nitrogen atmosphere. Dead end nanofiltration test was carried out to study the perm-selectivity of all the membranes under varied pressure and concentration of Pb(NO<sub>3</sub>)<sub>2</sub>. The complexation-NF membrane performances were significantly improved after the addition of GuA in the polymer matrix membrane system. M-GuA8 membrane showed optimum result of permeation flux 8.6 L/m<sup>2</sup>. h. Rejection of Pb(II) ions was observed to be around 97.6% at pH 9 for all the membranes due to electrostatic interaction between CA and Gum Arabic. Moreover, with the passage of time, rate of adsorption was also increased up to 15.7 mg/g till steady state was attained. Over all, Gum Arabic modified CA membranes can open up new possibilities in enhancing the permeability, hydrophilicity, anti-fouling properties.

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