

## Abstract

**Code of project** : A45/ 2014

**Project name** : The study of heavy metal ions adsorption on modified electrospun polyacrylonitrile nanofiber mats

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The electronics industries produced a large quantity of wastewater containing both of Cu(II) and Pb(II) ions that may result in significant problems to an environment and human body. The main objective of this study was to remove metal ions using polyacrylonitrile (PAN) fibers. PAN fiber mats were fabricated by electrospinning technique and further modified to contain amidino tetraethylenepentamine chelating groups on their surface. Then, the evaluation of their adsorption behaviors for Cu(II) and Pb(II) ions in aqueous solution were studied. The experiments were carried out at different parameters such as initial pH, initial concentration of the metal ion solutions, contact time. An increasing of contact time resulted in a monotonous increase in adsorbed amounts of the metal ions, which finally reached equilibria at about 5 h for Cu(II) and Pb(II). The adsorption efficiency of Cu(II) and Pb(II) ions on fiber mats from single heavy metal ion solutions were higher than binary heavy metal solution. This would be the effect from co-metal ion competition among the presence of other heavy metals. Equilibrium modeling of the adsorption isotherm showed that adsorption of Cu(II) and Pb(II) on the fiber mats were able to be described by Langmuir model. This study provides a promising adsorbent in heavy metal ions wastewater treatment.

**Keywords** : electrospinning process, modified PAN fiber, adsorption, metal removal

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