

**Title of Thesis:**       **Studies on Heavy Metals Removal from the Effluents of Metal Plating Industries**

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### ***SUMMARY***

Many industries including metal plating produce aqueous effluents containing heavy metals. The presence of heavy metals in the environment is a major concern because of their reported toxic and carcinogenic impacts. Therefore, it is essential to treat such industrial wastewater before the same is discharged into the environment.

In present study, electroplating wastewater samples, collected from two electroplating units operating in select industrial locations in Delhi, were analysed for their physico-chemical properties using standard methods. Electroplating effluents contained several heavy metals such as Cr(VI), Ni(II), Zn(II), Cd(II), Pb(II), etc. The utility of de-oiled cakes of Neem (*Azadirachta indica* A. Juss) and Jatropha (*Jatropha curcas* Linn.) as low cost adsorbents for the removal of Cr(VI), Cd(II) and Pb(II) metal ions from aqueous solutions was investigated.

The adsorbents were characterized using physico-chemical analysis, IR spectra and Scanning Electron Micrograph (SEM). The adsorption studies were carried out by batch experiments and the effect of various process parameters such as equilibrium time, initial concentration of metal ions, pH, adsorbent dose, particle size of the adsorbent, interfering ions and temperature were studied. The experimental data were analyzed by well known Langmuir and Freundlich isotherm models.

**Based on adsorption studies, it was concluded that de-oiled Neem and Jatropha cakes were suitable low-cost adsorbents for the removal of Cr(VI), Cd(II) and Pb(II) metal ions from wastewater. However, de-oiled Neem cake proved to be better adsorbent than de-oiled Jatropha cake.**