

Adsorption of Pb^{2+} from Aqueous Solution by Polyaniline, Polypyrrole and Polythiophene: A Comparative Study

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Abstract—*In-situ Oxidative polymerization methods are used to synthesize polyaniline (PANI), polypyrrole (PPY) and polythiophene (PTP). Pb^{2+} being positively charged is removed by PANI, PPY and PTP. The order of removal is PANI, PPY and PTP. The reason is the better complexing tendency of nitrogen than sulphur. The maximum adsorption capacity of PANI, PPY and PTP are 40 mg g^{-1} and 37.5 mg g^{-1} and 32.2 mg g^{-1} , respectively towards the removal of Pb^{2+} from aqueous solution. All polymers show Langmuir type of adsorption with Pb^{2+} . PANI and PPY follow pseudo-second order kinetics while as PTP shows pseudo-first order kinetics. Adsorption of Pb^{2+} on PANI and PPY are exothermic and on PTP, it is endothermic in nature. On the basis of the above findings, these polymers can be used as efficient adsorbents towards the removal of heavy metal ions from industrial samples.*