

E2-08 Unprecedented removal of Pb²⁺ by conducting polyaniline

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Polyaniline exists in 4 different structural forms: leucoemeraldine, emeraldine base, emeraldine salt and pernigraniline. These differ in the extent of oxidation and protonation of N atoms in the polymer chain. Of these, the emeraldine salt is of interest due to its inherent electronic conductivity. This form of the polymer is green in colour and is in its partially oxidised and protonated form. The overall electrical neutrality is then attained by the uptake of anions into the polymer. Cyclic voltammetric and atomic absorption spectrophotometric studies have established that this polymer is capable of removing Pb²⁺ ions from aqueous solutions despite the positively charged nature of the polymer backbone. It is proposed that Pb²⁺ is entrapped within the polymer matrix by the precipitation of Pb²⁺ with the anion already present in the polymer. The electrical neutrality is then attained by the uptake of anions from the external solution. Novel applications for the polymer are therefore envisaged in the removal of toxic metal ions from contaminated waters.