

## Summary

*In-situ and ex-situ* synthesis of metal nano particles can be a very interesting techniques to prepare iron nano particles with high surface area. Iron nano particles are prepared by the reduction of “ferric salt” with sodium borohydride in polyacrylamide and polyaniline-polyacrylamide mixed matrix. The as prepared products are amorphous material having small sizes. Upon annealing in air at 600 °C for 5 h, air stable Fe/Fe-oxide nanoparticles are formed with increased particle size. The nano particles are characterized by the UV-visible spectroscopy, SEM images and XRD studies. The magnetic properties and the I-V characteristic are also investigated. The Fourier transform infrared (FTIR) spectroscopy indicates that the nanoparticles are attracted to the pendant group of polymer through physical interactions.