

**Chemical synthesis of poly(3-thiophene-acetic-acid)/magnetite nanocomposites with tunable magnetic behaviour**, Janaky C, Endrodi B, Kovacs K, Timko M, Sapi A, Visy C, SYNTHETIC METALS, 160 (2010) 65-71.

**Abstract**

Conducting polymer-based magnetic composites with controlled magnetic behaviour have been synthesized by chemical polymerization in nanoparticle containing organic media. Poly(3-thiopheneacetic-acid)-Fe<sub>3</sub>O<sub>4</sub> hybrids have been prepared with five different iron-oxide contents, up to 20 m/m%, according to the results obtained by thermogravimetric analysis (TGA) and inductively coupled plasma atomic emission spectroscopic (ICP-AES) measurements. X-ray diffraction (XRD) and Mossbauer spectroscopic results gave direct evidences for the incorporation of both maghemite and magnetite. Photoacoustic Fourier transform infrared spectroscopic (PAS-FT-IR) measurements showed a chemical interaction between the polymer and the iron-oxide particles. SQUID investigations indicated a typical superparamagnetic behaviour for all samples, where saturation magnetization Values proved to be tunable by the Fe<sub>3</sub>O<sub>4</sub> content. After coating them onto electrode surfaces, basic electrochemical activity of the composite samples was demonstrated by cyclic voltammetry.