

electric properties, superconductors, semiconductors

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High Li⁺-Ion Storage Capacity and Double-Electrochromic Behavior of Sol-Gel-Derived Iron Oxide Thin Films with Sulfate Residues.

— Iron oxide films are fabricated by spin-coating sols (obtained from FeSO₄ by precipitation using NH₄OH solutions in the presence of H₂O₂ as an oxidant) onto ITO-coated glass substrates followed by annealing at 350 °C or above. The samples are characterized by TG-DTA, FTIR, XRD, TEM, and XPS. The results show that sulfate residues are adsorbed on the surface of Fe₂O₃ nanoparticles. Cyclic voltammetry reveals that the films annealed at 350 °C exhibit a Li⁺-ion storage capacity as high as ca. 0.50 mC/cm² per nanometer of the film thickness and show double-electrochromic behavior depending on the extent of intercalation during the electrochemical lithium insertion/extraction processes. The high charge capacity and nearly optical passiveness of the Fe₂O₃ films suggest their promising applications as counter-electrodes in electrochromic devices. — (WANG, ZHONGCHUN; HU, XINGFANG; KAELL, PER-OLOV; HELMERSSON, ULF; Chem. Mater. 13 (2001) 6, 1976-1983; Dep. Eng. Quim., Inst. Super. Tec., Tech. Univ. Lisbon, P-1096 Lisboa, Port.; EN)