MAGNETO-INDUCED EFFECT DURING MN-DOPED CU_2O ELECTROCRYSTALLIZATION

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In this paper, Mn-doped Cu_2O has been studied for the promising defect-induced ferromagnetism. Up to now, the origin of the high Tc ferromagnetism in Cu_2O base dilute semiconductors (DMSs) is not well understood. Defects and therefore synthesis modes are responsible for these magnetic properties. It has been shown that both the positions of the doping transition-metals (substitutional or interstitial Mn atoms) and the vacancies have strong influences on the ferromagnetism of the doped Cu_2O [1-2]. Previous results on $Cu_{2-x}Mn_xO$ electrodeposition have been reported [3], indicating that the ferromagnetic properties can be tuned simply by controlling electrochemical growth conditions. On the other hand, it has been shown that magnetic field brings modification on the electrocrystallization of Cu_2O [4-5]. Here the electrodeposition of copper oxide (with or without Mn doping) is reported with various Mn concentrations under 1T magnetic field superimposition. Comparison is made with electrodeposition obtained without magnetic field. Transient current curves can be drastically modified with Mn^{2+} electrolyte concentration and magnetic field superimposition [Fig]. In addition grain size and crystallite morphology are changed depending on the electrodeposition conditions.

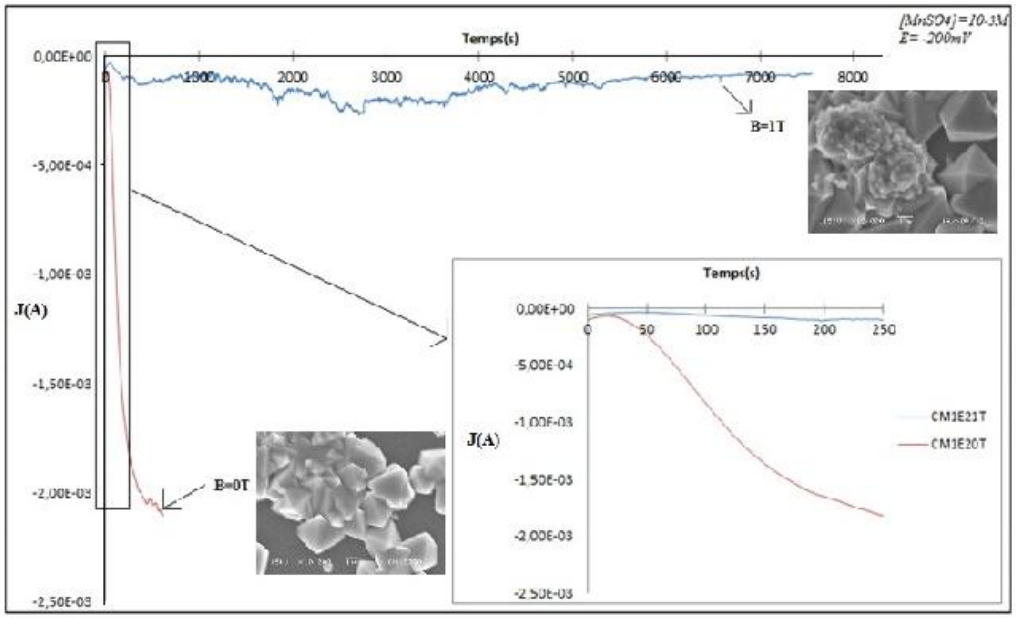

Figure: Current curve of Mn - doped Cu2O electrodeposition at - 200mV/ Ag _ AgCl and Q= - 1C with: [MnSO4] at 10 - 3 M, under magnetic field superposition B: (1) 0T and (2) 1T.

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