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**[ SEM-293 ] EXPERIMENTAL AND THEORETICAL STUDY OF CdS DEPOSITION  
BY CHEMICAL BATH**

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In this work experimental data from a chemical bath deposition process for CdS growth were compared against simulated data of the evolution of the concentration curves of  $\text{Cd}^{2+}$ ,  $\text{S}^{2-}$ , and cadmium complexes ( $\text{Cd}_n\text{OH}_m$ ,  $\text{Cd}_n(\text{NH}_4)_m^{2+}$ ,  $\text{CdCl}_m$ ), obtained with HySS speciation software. We considered equilibrium reactions of complexes from atmospheric  $\text{CO}_2$  hydrolysis like  $\text{HCO}_3^-$  and  $\text{CO}_3^{2-}$  on CdS formation mechanism. Series of CdS thin films were prepared in a bath containing 0.02M  $\text{CdCl}_2$ , 0.5M KOH, 1.5M  $\text{NH}_4\text{NO}_3$ , 0.2M  $\text{SC}(\text{NH}_2)_2$  at 65 °C, compared with another growth with only  $\text{CdCl}_2 + \text{KOH} + \text{NH}_4\text{NO}_3$  to compare  $\text{CdCO}_3$  formation non related with thiourea hydrolysis. The model was initially feed with experimental data from the chemical bath, i.e.  $[\text{NO}_3^-]$  was determined by Raman spectroscopy, pH,  $\text{pCd}^{2+}$  and  $\text{pS}^{2-}$  from potentiometric data. The pH evolution was reproduced almost exactly with the proposed model. Films were characterized by XRD and UV-Vis spectroscopy, Film thickness was calculated by using SCOUT software from transmittance data.  $\text{CdCO}_3$  was identified by XRD confirming the influence of atmospheric  $\text{CO}_2$  and also the data indicate an important role of the nitrate complexes in the film growth kinetics. Funded by CONACYT 151679Q , 169108, SIP 20131877 Projects.









