SYNTHESIS OF IRON SULFIDE FILMS ON LOW ALLOYED STEELS: THERMAL EXPERIMENTS

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Powders of iron, magnetite and hematite were oxidized, reduced and sulfided and the resulting weight changes and heat flows analyzed in comparison with literature data. Oxidation was done either in dry synthetic air or with the same gas flow saturated with moisture at room temperature. Moisture during oxidation of a fresh iron surface lowered the onset temperature and enhanced the rate of the subsequent reduction in hydrogen. Moisture during oxidation also influenced the onset temperature of sulfidation of oxidized iron as well as hematite. Cu(II)formate tetrahydrate/cupric formate tetrahydrate, Cu(HCOO)₂ @ 4 H₂O was added in a second set of experiments, in an attempt to form an overlayer of chalcopyrite on low alloyed steel. Mineral Chalcopyrite is difficult to oxidize and has an attractive golden shine. Cu(II)formate tetrahydrate/cupric formate tetrahydrate, Cu(HCOO)₂ @ 4 H₂O is a common additive in CVD synthesis of copper compounds.