Formation of ferrous acetate from magnetite ore via iron hydroxide precipitate

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Iron oxide separated from the magnetite ore by using appropriate sieves and magnetic separation was dissolved in hydrochloric acid and oxalic acid, respectively, and then hydrogen peroxide added in order to reduce ferric ion in magnetite solution. Iron hydroxide precipitate from hydrochloric acid/oxalic acid solution was obtained at pH 3.5-4 and then ferrous acetate precipitate was obtained by reaction of iron hydroxide precipitate in the mixture of aqueous acetic acid solution and acetic anhydride at 90℃. The bonding mode of the acetate group to ferrous acetate was confirmed to be bidentate by FT-IR analysis. The XPS analysis demonstrate that a multiplicity of Fe^{2+} and/or Fe^{3+}, chemical state and binding energies are present in ferrous acetate samples. XRD and SEM analyses revealed that ferrous acetate precipitate is amorphous or low crystalline state.