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KEY WORD : GAMMA FERRIC OXIDE/GOETHITE

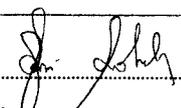
WIROTE KAMONDETDECHA : PREPARATION OF ACICULAR GAMMA-FERRIC OXIDE FROM FERROUS SULPHATE SOLUTION. THESIS ADVISOR : ASST.PROF.CHATCHAI SOMSIRI, Ph.D. 112 pp. ISBN 974-633-143-4

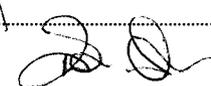
The objective of this research is to study optimum conditons for preparation of acicular maghemite (γ - Fe_2O_3) which could be used as recording medium. An important step of preparation is the particles must be prepared from acicular goethite and the particle size must be smaller than 1 micron (μm). The particles have to go through in many steps of heat treatment in order to change them from goethite (α - FeOOH) to their final form, maghemite (γ - Fe_2O_3). In this experiment, $\text{NaOH} - \text{FeSO}_4$ solution was used to synthesize acicular goethite particles. Studies of the influences of various factors such as molar ratio of $\text{NaOH}/\text{FeSO}_4$ oxidation temperature and oxidation rate on the particle phase and size were made. It was found that the acicular goethite particles would be prepared when the molar ratio of $\text{NaOH}/\text{FeSO}_4$ were greater than 2 and the better acicular shape would be obtained by increasing the molar ratio of $\text{NaOH}/\text{FeSO}_4$. Higher oxidation temperature would yield larger acicular goethite particles as well as increase a chance of precipitation of magnetite (Fe_3O_4) particles which is undersirable. The oxidation rate was found not to effect the particle phase and size but it influences the reaction time only. Effects of temperature on the particle phase in the heat treatment process were studied. It was found that the reaction of dehydration did not completed ; there are some residue of acicular goethite particles ; if the temperature was below 350°C . During reduction, if the temperature above 350°C . It may be occur other reaction which make we get some impurities (FeO and Fe). The final step of oxidation was carried out below 250°C . The reaction may not have been completed in this step since there were some residue of magnetite Fe_3O_4 particles . However, it was found that the characteristics of maghemite (γ - Fe_2O_3) particles which were synthesized with suitable conditions in this experiment are equal to those of commercial grades.

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