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819,977 PROCESS FOR PREPARATION OF ACICULAR γ - IRON(III) OXIDE

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Fine, acicular, crystalline particles of essentially α -iron(III) oxide hydrate are prepared by (1) mixing together (A) an aqueous alkaline solution (e.g. sodium hydroxide solution) and (B) an aqueous solution of an iron(III) salt (e.g. ferric chloride) together with a relatively small percentage of an iron(II) salt (e.g. ferrous chloride), to form a precipitate; and (2) thereafter heating the precipitate under pressure to transform it into said particles. The reaction should be carried out at a pH between 11 and 12, preferably between 11.5 and 11.9, and the ratio of gram-atoms of iron(II) salt to gram-atoms of iron(III) salt should be at least about 10^{-4} but not greater than about 10^{-1} . Alternatively, similar results may be obtained by including a small quantity of an anionic surfactant (e.g. sodium alkyl naphthalene sulfonate) in solution B in place of the iron(II) salt. The α -iron(III) oxide hydrate particles resulting from either of these reactions are especially useful for conversion, by the known additional successive steps of dehydration, reduction to Fe_3O_4 and final oxidation, to magnetic γ -iron(III) oxide particles for use in magnetic record members.