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# Iron Alkoxide Obtained by Reacting Iron Oxides with Glycerol

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**Abstract:** Goethite, lepidocrocite and hematite were reacted with glycerol and reaction products were studied at various steps of the reaction. After a treatment of 16 hr at 245° C the final form of the reaction product, a deep green soft solid, was obtained whatever the starting material. According to hydrolysis and chemical analysis, the reaction product can be identified as iron alkoxide. Hydrolysis of the solid by boiling water yielded glycerol and a strongly magnetic material characterized by a spinel structure like maghemite and magnetite.

The iron alkoxide is seen by electron microscope as large well-formed hexagonal platelets. The similarity between *a* and *b* parameters of this compound and those of brucite suggests that the iron alkoxide structure is based on an iron (II and III) octahedral layer. The glycerol chains should be located between the sheets. Two models were proposed in which iron and oxygen, linked to the chain of glycerol, could be accommodated in octahedral layers giving a basal distance of  $8 \cdot 1 \text{ \AA}$ .

At least two steps are involved in the formation of the iron alkoxide: (1) a rearrangement of the structure of the starting material with accomodation of carbon in the structure and (2) a reduction of ferric iron.

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