

Mineralization and mobilization of REE in the Proterozoic Fe-Cu-(REE) deposits in SW China

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There are a number of Fe-Cu deposits in the SW Yangtze Block, South China. These deposits have the mineralization styles of typical IOCG deposits. They contain Fe-oxides (magnetite and hematite) and/or Cu-sulfides (chalcopyrite and bornite) as major components with variable amounts of Au, Ag, Co, and REE. Fe-oxides have low TiO_2 and V_2O_5 , suggesting a hydrothermal origin. The paragenetic sequence includes early Na alteration followed by mineralization of magnetite and magnetite-polymetallic sulfides that are overprinted by sulfide-quartz veins and finally by barren quartz-carbonate veins. Magnetite mineralization was associated with pervasive Na-Fe alteration that formed albite, chlorite and actinolite. In this stage, abundant apatite is rich in REEs. In a later stage, abundant Fe-Cu-Mo sulfides are intergrown with magnetite and minor titanite, allanite and REE minerals, and are associated with carbonate, quartz, fluorite and mica. REEs in apatite were remobilized through a dissolution-precipitation process. On the basis of new fluid inclusion and mineralogical data, a new model is proposed to interpret the formation of these deposits in an involving magmatic-hydrothermal system.

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