Study of the Occurrence of Fe in Sericites of Grea Mica Mine, China

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Sericite is a common industrial mineral. The Grea Mica Mine in Anhui Province, South China, is one of the deposits of this resources. The typical mineral content of Grea mica ore is sericite 60%, quartz 30% and feldspar 10% in volume. The XRD of sericites, separated by water washing pan, shows the mica is $2M_1$ type. The chemical composition of the ore and sericite analyzed by XRF shows in table 1, where FeO was wet chemical analyses results, TFe_2O_3 was XRF results and Fe_2O_3 was calculate by the formula of $Fe_2O_3 = T Fe_2O_3 - 1.11135 FeO$.

Table 1 Typical composition of ore and sericite (wt.%)

Sample	SiO_2	Al_2O_3	TFe_2O_3	Fe_2O_3	FeO	LOI	Total
LC-08-ore	62.68	21.00	1.67	1.37	0.27	3.37	100.00
LC-08-min	51.35	27.7	2.50	2.22	0.25	4.63	99.03

Calculate formula: $K_{1.8.8}(Mg_{0.542},Fe_{0.25},Al_{3.182})(Si_{3.426},Al_{0.574})_2O_{20}(OH)_4$

Based on above data, the distribution of ferrous and ferric ions in the ore was gotten. The results are 97.23% Fe^{3+} and 55.56% Fe^{2+} in ore occurrence in sericite.The IR spectrum shows high end characteristics[1] by the ion numbers of Mg and Fe taking in octahedron.

The study of EPR spectra (fig.1) of ore and sericite proves that Fe^{3+} are main iron form both in ores and sericites. The structural ferric ions in sericite crystal lattice play as main part of the iron. A little ferrous and ferric occurs in form of oxide and hydroxide inpure minerals.
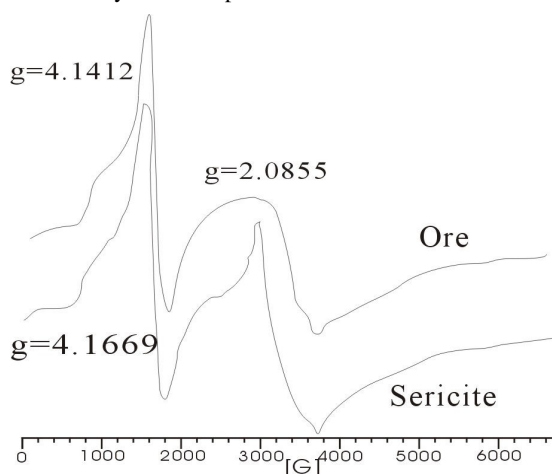

Fig. 1. EPR spectra of sericite and ore

The results of this research is great helpful to guide the industrial production in similar process in this area.

References

[1] Higashi S. 1980, Memoirs of the Faculty of Science, Kochi University. Series E. Geology **1,** 1 ~ 39.