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SWIR characteristics of alteration minerals in Tongshankou porphyry-skarn Cu - Mo deposit in the Southeastern Hubei Fe-Cu Province, eastern China

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Short wavelength infrared spectrum (SWIR), combined with EPMA and LA-ICP-MS analysis of alteration minerals has been convinced to play a vital role in the exploration of some very young porphyry and epithermal deposits [1, 2]. The Tongshankou Cu-Mo deposit which is situated in the southeastern Hubei Fe-Cu province along the Middle-Lower reaches of the Yangtze River, eastern China, consists of both porphyry and skarn mineralization. Dating results shows that the ore-forming age is ca. 143 Ma [3]. Orebodies are hosted in the contact region of the Tongshankou granodiorite porphyry and the carbonates. Detailed field work and microscopic observations show that the main alteration in the deposit consist of potassic alteration, sericification, silicification, skarnization, serpentinization, chloritization and epidonization. The phenomenon of garnet crosscutting chlorite imply that two stages of skarn alteration occurred in the deposit. Detailed SWIR analysis on 14 drilling holes show the existence of alteration minerals as chlorite, illite, ankerite, muscovite, talc, montmorillonite, serpentine, kaolinite. Three-dimensional alteration mineral mapping were done combined with field and microscopic observations. We analyze the values of position 1900, depth 1900, position 2200, depth 2200, and IC according to the drilling holes. Results show that these values coincide with the distribution of the ore bodies to some extent but not very good. Our work shows that we should use SWIR more carefully when carrying these work on a deposit which suffered to later reworking.

References:

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