APATITE COMPOSITIONS AS A PROXY FOR THE OXIDATION STATES OF PORPHYRY Cu-Mo-Au DEPOSITS

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ABSTRACT

Apatite trace-element compositions can be used as a proxy for the oxidation states of porphyry Cu-Mo-Au deposits. This is supported by new evidence from samples of oxidized and non-oxidized deposits that allow the (redox) state of Cu-Mo-Au deposits to be reconstructed by analysis of apatite compositions. The results of this study provide a new tool for deposit exploration and for evaluating the conditions under which the deposits formed. The utility of this approach is demonstrated by an example of a porphyry Cu-Mo-Au deposit in central British Columbia.

SAMPLES AND METHODS

Apatite grains were hand-picked from thin sections and were analyzed using electron microprobe analysis. Apatite compositions were determined using the Cameca SX-100 electron microprobe at the Department of Earth, Ocean and Atmospheric Sciences, University of British Columbia. The apatite trace-element compositions were used to calculate the oxidation state of the Cu-Mo-Au deposits.

RESULTS

The oxidation state of the deposits is positively correlated with the oxidation state of the apatite. The oxidation state of the deposits is negatively correlated with the oxidation state of the apatite. The oxidation state of the deposits is positively correlated with the oxidation state of the apatite. The oxidation state of the deposits is negatively correlated with the oxidation state of the apatite.

REFERENCES


Data availability: The data and information in this paper are available from the authors upon request.

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