

BIOTITE AND CHLORITE GEOTHERMOMETRY OF THE LOMAS BAYAS PORPHYRY COPPER DEPOSIT IN NORTHERN CHILÉ

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The Lomas Bayas porphyry copper deposit is located in northern Chile approximately 110km north east of the port city of Antofagasta. The deposit is hosted by a Paleocene granodiorite which has been intruded by a feldspar porphyry (Chávez, 1998). The predominant alteration present is a weak K-silicate constructive potassic alteration characterized by biotite + K feldspar + quartz with biotite replacement of magmatic mafic minerals. This has been overprinted by incipient – weak chloritization. The purpose of this study is to determine the temperature of formation of the hydrothermal alteration at Lomas Bayas by using electron microprobe analyses of hydrothermal biotite and chlorite grains for use as a vectoring tool in exploration, focusing on the Ti and Mg# ($Mg/(Mg+Fe)$) relationships as a function of temperature described by (Henry et al., 2002; Henry et al., 2005; Wu and Chen, 2015) as well as the tetrahedral Al-Si relationship in chlorite related to temperature (Cathelineau, 1988; Caritat et al., 1993).

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