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EARTH EVOLUTION SCIENCES UNIVERSITY OF TSUKUBA

筑波大学 地球進化科学

Application of O,H and S isotope studies to the understanding of fluids in porphyry Cu-Au system with particular emphasis on advanced argillic alteration

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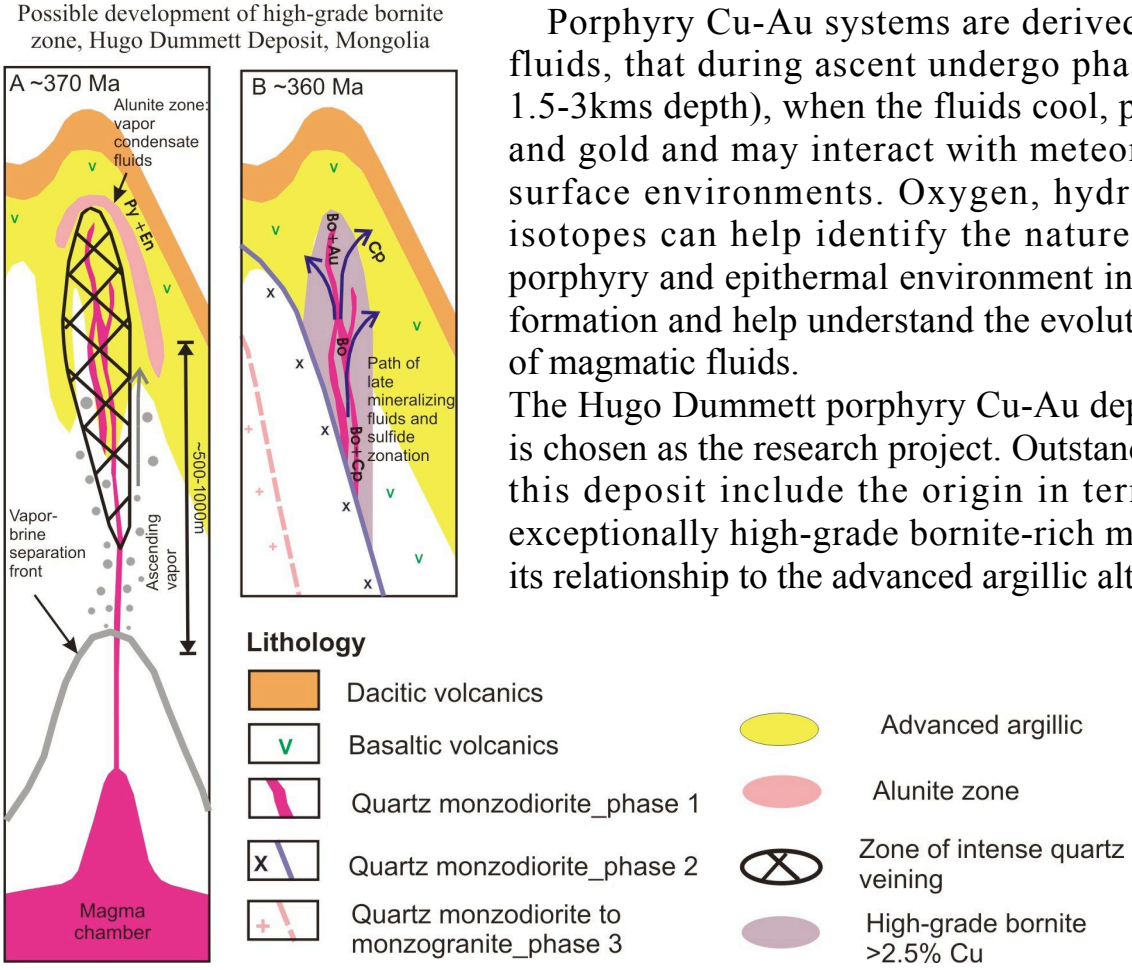
(惑星資源科学 3 年)



Porphyry Cu-Au systems are derived from magmatic fluids, that during ascent undergo phase separation (at 1.5-3kms depth), when the fluids cool, precipitate copper and gold and may interact with meteoric water in near surface environments. Oxygen, hydrogen and sulfur isotopes can help identify the nature of fluids in the porphyry and epithermal environment in terms of mineral formation and help understand the evolution for the ascent of magmatic fluids.

The Hugo Dummett porphyry Cu-Au deposit in Mongolia is chosen as the research project. Outstanding problems for this deposit include the origin in terms of fluids for exceptionally high-grade bornite-rich mineralization and its relationship to the advanced argillic alteration zone.

Figure. A: High-temperature quartz veining related to small quartz mondiorite intrusions (`370 Ma), with overprinting zone of AA alteration, formed as the vapor-brine separation front recedes, B: Late mineralizing event (? ~360 Ma) overprints the early system, and forms an exceptionally high-grade deposit.