

**Platinum-group element
geochemistry of porphyry Cu \pm Au
ore-bearing and barren suites in the
Urumieh-Dokhtar magmatic
assemblage, Iran**

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Giant to small porphyry Cu (\pm Au) deposits occur in association with the Miocene post-collisional igneous rocks of the Urumieh-Dokhtar magmatic assemblage (UDMA), Iran. Previous studies showed that the ore-bearing suites have higher Sr/Y and ϵ Nd_i values than the barren suites. They suggested that the primary magmas of the ore-bearing porphyries are produced by partial melting of the sulfide-rich juvenile lower crustal cumulates. During this process, chalcophile metals such as Cu and Au in the cumulative sulfides may have been transferred into the ore-bearing magma, increasing their ore potential. If the hypothesis is correct, there should be systematic differences between the ore-bearing and barren suites in platinum-group element (PGE) geochemistry.

To test the hypothesis, we measured the PGE contents of seven porphyry Cu (\pm Au) ore-bearing and four barren suites from the UDMA in this study. The results show that ore-bearing rocks have higher chalcophile element fertility, i.e., high Pd/MgO and Pd/Pt values than the barren rocks, which indicates the enrichment of chalcophile elements at the time of fluid saturation. This confirms the hypothesis that chalcophile element fertility plays an important role in the formation of porphyry Cu (\pm Au) deposits in this region. Another notable point is that ore-bearing rocks have higher Pd/Ir values than the barren rocks systematically. We attribute the discrepancy to different sulfide saturation history between the ore-bearing and barren suites.