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Behaviour, geochemical distribution, and mode of occurrence of gold and silver in the Sar Cheshmeh porphyry copper deposit, Kerman, Iran

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Abstract: Based on this study, the average gold and silver grades in the Sar Cheshmeh porphyry copper deposit are 0.06 and 1.22 g/t respectively which are very different from the ones reported previously. In the biotitic andesite and altered phyllic/potassic samples from the stock, the high positive correlation between the hypogene copper and gold grades ($r=0.81$), and gold and silver grades ($r=0.61$), and gold and silver with the hypogene copper grade ($r\geq0.72$), indicate:(1) the contemporaneous deposition of copper, gold and silver, and (2) gold is probably present in the form of exsolution, invisible solid solution and native or electrum within the chalcopyrite grains.

Within the secondary sulfide enrichment zone, the gold grade is two times more than the hypogene grade. Silver also indicates the highest concentration within the leached/oxide and secondary sulfide enrichment zones.

This study indicates that the Sar Cheshmeh deposit is a gold and silver poor porphyry copper - molybdenum deposit.

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