

## **Correlations Between Os Isotopic Composition and Trace Element Abundance in Chinese Cu-Ni Deposit Sulfides**

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We have determined the Os isotopic composition (ID-MC-ICPMS) and trace element abundances (LA-ICPMS) in sulfide minerals from 4 Cu-Ni deposits in southern China. The samples separate into 2 groups based on Re/Os ratio. The high Re/Os deposits yield a  $278 \pm 35$  Ma isochron (MSWD = 3.7) and an initial  $\gamma_{Os}$  of 255. The low Re/Os deposits define a  $278 \pm 20$  Ma isochron (MSWD = 15), and an initial  $\gamma_{Os}$  of 49, showing that mineralization was contemporaneous, but the amount of crustal contamination and/or R-factor in the two groups was different. These differences are also reflected in sulfide mineral trace element variations. Laser ablation shows that Re, Os, and Ir are in solid solution with pentlandite and pyrrhotite and Au and Pd are enriched in pentlandite over pyrrhotite. Pt was rarely observed above detection, but when present occurs as isolated Pt peaks. For the high Re/Os whole rock samples the average sulfide Re and Os concentration agree with the whole rock data, but in the low Re/Os whole rock samples the sulfide Re and Os are higher, suggesting that chalcopyrite with its Re/Os of  $>5$  is an important mass balance component. Trace element modeling is complicated by the fact that Cu, Zn, Ga, As, Cd, Te, Ag, Au, Pb and Bi while occurring in solid solution with pentlandite and pyrrhotite are often present as sulfide mineral inclusions. Examination of ablation signals shows anti-correlation between some elements (e.g. Te and Pb) and that numerous off-set peaks also occur within single ablations. None-the-less, Ag tends to be enriched in pentlandite over pyrrhotite in the low Re/Os group and evenly distributed between the sulfides in the high Re/Os group. Cd, Pb and Bi are enriched in high Re/Os group sulfides suggesting that while the difference in initial  $\gamma_{Os}$  can be modeled as variation in R-factor, the degree of radiogenicity of the initial  $\gamma_{Os}$  in mafic-ultramafic ore deposits is ultimately controlled by the degree of crustal contamination.