

Fractionated Os/Ir ratios in ophiolitic serpentinites from the eastern Central Alps (Switzerland) and the Valmalenco (Italy)

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Osmium, Ir, Ru, Pt, Pd, and Au have been determined in twenty-three serpentinites from Oberhalbstein (Engadin) and the Valmalenco (VM). Sample locations and detailed mineralogical descriptions are given in Burkhard [1] and Burkhard & O'Neil [2]. Samples were analyzed with NiS fire assay INAA on 10 g aliquots of sample powders. Bulk rock Os contents from the Arosa-Platta nappe (APn) serpentinites (Iherzolites) with a mean of 5 ± 1 ng/g (N=4) are significantly higher than the mean of 3.2 ± 0.6 ng/g (N=4) from the VM. Ir bulk rock contents of APn serpentinites with a mean value of 2.9 ± 0.7 ng/g (N=8) overlap with Ir contents from VM serpentinites with a mean value of 3.2 ± 0.8 ng/g (N=7). Serpentinites from Oberhalbstein and the VM can be clearly distinguished by their Os/Ir element ratios. The VM serpentinites have low Os/Ir (0.9 ± 0.1 , N=4) compared to APn serpentinites (Os/Ir = 1.5 ± 0.2 ; N=4). The mean Ru/Ir from both suites overlap with ratios of 2.8 ± 1.1 (N=5) and 2.0 ± 0.3 (N=2), respectively. The mean value of Pd is 6.1 ± 1.9 ng/g (N=4). Highly variable Au contents of about 0.4 ng/g to 76 ng/g (N=23) suggest that Au is very heterogeneously distributed in host rocks of both suites due to gold mineralizations, probably Cu_3Au , since one of the Au enriched sample has high Cu of 18 mg/g (native Cu?). Two samples from APn and VM have high Ir, Pt and Pd of up to 18.5 ng/g, 62 ng/g, and 26 ng/g, respectively. These high contents may be due to variable amounts of Ir-Pt-Pd-rich phases (probably rozhkovit, gersdorffite, cobaltite) in the host rocks. Low Os/Ir in VM serpentinites may result from redistribution combined with serpentinization, metamorphic fluids and/or, most likely, by contact metamorphism caused by the late Tertiary granodiorite, the Bergell intrusion.

[1] Burkhard (1987) Ph.D. thesis. *Heidelberg University*, 345p. [2] Burkhard & O'Neil (1988) *Contrib. Miner. Petrol.* **99**, 498-506.