

1.3 Ma, respectively. Interestingly molybdenite in scheelite-quartz stockwork veins underlying the laminated high-grade quartzitic scheelite ore body in the abandoned Eastern Ore Field yielded 343.0 ± 1.4 Ma, which is within the 2 sigma uncertainty of the ages from the Western Ore Field; previously this mineralisation has been interpreted as Cambrian in age (Hoell and Eichhorn, 2000). A Re-Os isochron age of 340.1 ± 8.4 Ma, calculated from these four data, is regarded as the best estimate for molybdenite formation at Felbertal. One molybdenite sample from a strongly deformed vein in a retrogressed metabasite found at the Eastern Ore Field gave a mean age of 416 ± 19 Ma.

The Alpeiner Scharte Mo mineralisation in the western Tauern Window is hosted by Variscan metagranitoids, which intruded into a basement of metasediments and older intrusives. Molybdenum mineralisation is hosted in E-W trending quartz veins and rarely in aplitic dykes and evidence the same Alpine deformation (D1-D4) and metamorphic history (550-600°C, 7-8 kbar) as the host rocks. Extremely low Re concentrations prevented successful Re-Os dating of molybdenite but may indicate a crustal source of metals. Magmatic zircon grains from two orthogneisses were dated at the NORDSIM laboratory in Stockholm. U-Pb ion probe dating of a coarse-grained leucocratic orthogneiss ("Typ Fußstein") gave an emplacement age of 304.4 ± 7.1 Ma (Tera

Wasserburg plot, 2 sigma uncertainty); a second sample from the biotite-rich orthogneiss variety ("Typ Alpeiner-scharte"), which is crosscut by Mo veins yielded 308 ± 4.6 Ma. Hence Mo veins at Alpeiner Scharte must be younger than ~303 Ma but predate Alpine events.

Two independent Variscan mineralisation stages, each genetically related to granite-related magmatic-hydrothermal systems are distinguished in the Tauern area. A main stage of W(-Mo) mineralisation of early Carboniferous age is recorded for Felbertal. In contrast Mo-veins at Alpeiner Scharte are significantly younger and related to post-orogenic (?) late Carboniferous magmatic activity.

A pre-Variscan mineralisation stage is so far only indicated by the ~420 Ma molybdenite age from Felbertal. We may speculate that it corresponds to Caledonian high-P metamorphism documented from elsewhere in the Tauern Window. A Cambrian mineralisation stage, postulated for Felbertal by Hoell and Eichhorn (2000) has not yet been confirmed.

Hoell, R. & Eichhorn, R., 2000, Tungsten mineralization and metamorphic remobilization in the Felbertal scheelite deposit, Central Alps, Austria [Monograph] Metamorphosed and metamorphogenic ore deposits: Rev. Econ. Geol., 233-264.

Zur Geochemie jurassischer Manganschiefer der Nördlichen Kalkalpen - hydrogene versus hydrothermale Entstehung stratiformer Manganmineralisationen der Ostalpen

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Die Bildungsbedingungen pelagischer Manganschiefer aus dem Jura der Ostalpen können durch die Untersuchung der Seltenen Erd Elemente, Haupt- und Spurenelemente besser verstanden werden. In diesem Beitrag werden Daten aus 24 Proben der Nördlichen Kalkalpen präsentiert. Die Verteilung der Haupt- und Spurenelemente wird vom terrigenen Detritus bestimmt. Die Verteilung der Seltenen Erd Elemente und die

Beziehung zwischen organischem Kohlenstoff und (pyritisch gebundenem) Schwefel kann dagegen zur genetischen Interpretation der Mangananreicherung herangezogen werden. Es zeigt sich, dass die Analysendaten dieser Studie durch das Modell der hydrogenen Manganabscheidung durch stark variierende Redox-Verhältnisse am Meeresboden erklärt werden können.