In situ U-Pb dating of scheelite: Constraints on the age and genesis of the Felbertal tungsten deposit

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The Felbertal scheelite deposit, Salzburg province, Austria, is one of the biggest tungsten producers in the world. It has long been regarded as the type locality of stratiform-stratabound scheelite deposits. The deposit is situated in the Habach Complex, an Early Cambrian to Ordovician metavolcano-sedimentary ophiolitic to arc sequence. A chemically unusual W-bearing granite, the K1 orthogneiss, was emplaced in the Early Carboniferous into the western ore zone of the deposit. Several economic scheelite ore bodies are spatially associated with this orthogneiss. The ore deposit was overprinted during the Variscan (~330 Ma) and Alpine (~30 Ma) orogenies. Economic scheelite mineralisation is associated with SiO_2-rich lithologies including foliated fine-grained scheelite-quartz ores ('Scheelite-rich quartzite'), deformed quartz veins and stockwork like mineralisation. Trace element analyses using LA-ICP-MS techniques, controlled by cathodoluminescence (CL) images, confirmed the previously established classification of scheelite stages. Scheelite 1 is preserved as relict cores in fine-grained scheelite in the mylonitic scheelite-quartz ores. It preserves delicate oscillatory growth zoning, is characterised by flat wing-shaped REE patterns, and contains between 50 to 1120 ppm U. *In situ* U-Pb dating by LA-SF-ICP-MS of Scheelite 1 yielded a concordia age of 335.5 ± 4.6 (2 sigma). This new age constrains the timing of scheelite formation of this ore type for which a Cambrian age was previously assumed [1]. Within the uncertainty this new age is indistinguishable from the published 336 ± 19 Ma emplacement age of the K1 orthogneiss. The new scheelite age is inconsistent with previous genetic models, which proposed either syngenetic ore formation in the Cambrian or two stages of epigenetic ore formation, the first in the Cambrian and the second in the Early Carboniferous [1]. The Felbertal scheelite deposit is best interpreted as a metamorphosed granite-related magmatic-hydrothermal ore deposit of exclusively Early Carboniferous age.

[1] Eichhorn *et al*. (1999) *Int. J. Earth Sci*. **88**, 496–512.

Geochemical and mineralogical features of coal combustion wastes (CCW) of Angren Thermal Power Station (TPS) and possible ways of their recycling, Uzbekistan

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The Angren TPS working on the basis of Angren lignite was found in 1958, during this 53 years functioning were generated 13 million tons of CCW and disposed in 3 coal ash dumps (203 acre). The physical and chemical characteristics of CCW have bearing on both its potential for use and its potential to present some level of risk to human health and the environment. Elemental and mineralogical content of samples from Angren CCW were checked by XRF and JEOL Superprobe microzond. The results of chemical and mineralogical analyses showed high content of metals and minerals with magnetic features (magnetite, haematite, titan-magnetite etc.), concentration of trace elements, as well as rare- earth elements etc. were elevated also. Subsamples were subjected to magnetic separation, results show that content of minerals with ferromagnetic feature is 65% of total mass. Investigations under the JEOL microanalizer show that in spherical magnetic aggregates are containing Fe, Ti, Mn and W in high value.

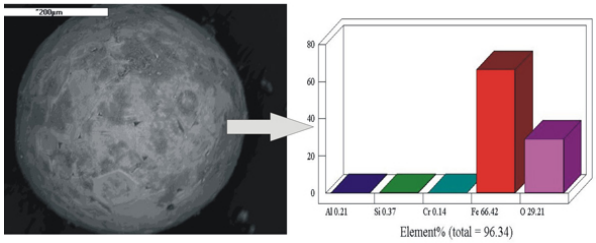

Figure 1: SEM image of magnetic particle and distribution ratio some magnetic elements.

High concentration of Fe and Mn in studied CCW samples showing their effective utilization and bright perspective for using as a raw material for producing several kinds of Ferroalloy for metallurgical industry.