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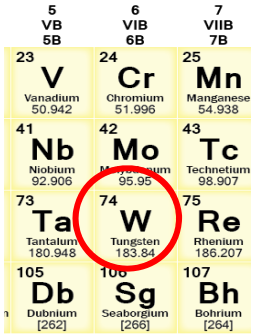
Master thesis announcement:

Predicting the bioavailability of tungsten (W) in W contaminated soil using different soil chemical methods

Tungsten (W) is a transition metal that resides in the chromium (Cr) group (Group VI) of the periodic table along with Cr and molybdenum (Mo). A variety of W minerals is known but only four (wolframite ((Fe, Mn) WO_4), hübnerite ($MnWO_4$), ferberite ($FeWO_4$) and scheelite ($CaWO_4$)) are of economic importance, with the latter being heavily mined in Felbertal, Salzburg Austria.

Increasing industrial and military use of W-based products, ranging from household appliances to high-end technology goods, opened new pathways of W into environmental systems. Main routes of entry into the environment include emission and discharge of W-containing waste products by W production plants, military activities, W tire stud and road abrasion, coal combustion and soil fertilizer application.

The aim of this master thesis is to investigate W uptake by soy (*Glycine max*) depending on soil chemical properties and to test a range of soil chemical methods to predict W phytoavailability. Due to the close chemical similarity between W and molybdenum (Mo, same atomic radius, coordination & redox chemistry) the effect of W on plant N assimilation (Mo containing nitrate reductase) and symbiotic N_2 fixation (Mo containing nitrogenase) by *Bradyrhizobium japonicum* will be monitored using the $\delta^{15}N$ natural abundance method.



Results will serve as scientific basis to help assessing the potential risks of elevated W concentrations in soils and provide new insights into the behaviour of W in natural systems.

The work will include greenhouse and laboratory experiments.

Duration: approximately 6 months

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