

New insights from speciation analyses on trace metal oxyanion geochemistry in modern and ancient sulfidic settings

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Trace metal oxyanions are a particular type of redox sensitive elements because their presumed stable form in oxygenated waters is composed by a central metal cation (Me^{Z+}) surrounded either by oxygen atoms ($-\text{O}$), hydroxyl molecules ($-\text{OH}$), or a combination of both ($-\text{OOH}$) acting as anionic ligands. General formulas can either be $\text{MeO}_x^{(z-x)-}$ or $\text{Me}(\text{OH})_x^{(z-x)-}$. In this keynote I will give an update on our understanding of the geochemical controls involved in the burial pathways of molybdenum (Mo), rhenium (Re), chromium (Cr) and vanadium (V) in sulfidic settings. More particularly I will discuss the role of sulfide S(-II), iron-sulfur mineral and organic matter phases, independently but also concomitantly. A particular emphasize will be given to the importance of characterizing the speciation of trace metal oxyanions as it pertains to their reactivity and therefore ultimately to their sinks.