**Interest of manganese oxides in Earth Sciences: dating of weathering processes**

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The chemical element “Mn” for “**Manganese**” is a little-known element used by metallurgists and chemists, occurring in the form of silicate, carbonate or oxide in natural environment. It is the 10th most abundant element in the Earth crust and the 4th most produced metal in the world. The remarkable property of manganese, in contrast to many other types of mineral resources, is that accumulation of this metal in rocks is distributed in the wide geochronological interval from the Archean to the present time. Various processes are able to accumulate manganese in rocks and minerals. Among them, sedimentary-derived ores are the main valuable resources throughout the world instead of the hydrothermal or metamorphic types, as they offer large extension, constant grades and compositions. However, processes occurring in the **supergene zone** of these deposits (i.e., weathering processes) significantly increase their Mn concentration to meet economic grades, where a clear benefit is created by the presence of secondary **Mn oxides, hydroxides and oxyhydroxides**. Some K-bearing Mn oxides belonging to the **hollandite supergroup** [(K,Ba,Pb,Na,Sr)Mn8O16] occur in the supergene zone of Mn (and other) deposits and can accurately be dated by the K-Ar system. Therefore, such material offers an incomparable way to unravel the **timing** of these ores and investigate the **parameters** responsible for the weathering of rocks. This is especially true when weathering develops upon Mn protores, from which the total weathering history of an area can be depicted. Interestingly, the process from which protores are exposed to meteoric agents implies **geodynamic** to be one important parameter controlling the development of weathering with **climate**, the latter being considered as the main driver. This presentation focuses on the essential aspects of Mn (and more specifically when it forms oxides) and their usefulness in the timing of geological processes. Recent publications from North Africa and Belgium will be presented, as well as the ongoing research around the Massif Central in the project “Source to Sink”.