Geochemical modelling of salt systems: Case study Sebkha Om lekhialate

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The process of evaporation constitutes very important phenomena in formation of salt system in arid environment [1]. Based in hydrogeochemical modeling, CHEPROO and PROOST using data base Pitzer [2] elaborate the evolution of the salt sequence minerals according to the time and along the distance.

The center of sabkha in characterized by enrichment in mirabilite (Na_2 SO_4 $10H_2O$) and depletion of calcium in clay formation.

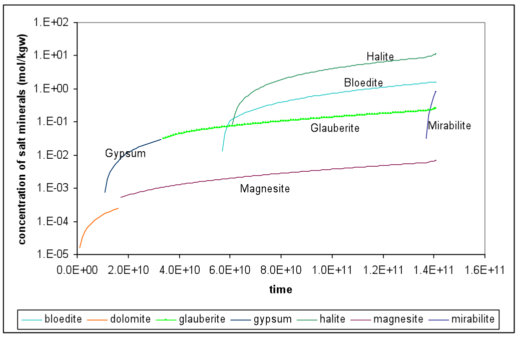

Fig. Salt minerals according to the time

[1] Bouhlila 1999 thesis ENIT. [2] Pablo *et al*. 2011 Journal of Hydrology **401** 154–164

Chromium mobility in Tuscan serpentinite bodies: Inferences from rodingitization and carbonation

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The natural heavy metal enrichment of Tuscan ultramafic rock bodies and derived soils represents an important environmental concern for the area in which they outcrop. Moreover, most of them are superficial acquifers due to their high level of fracturing, thus representing an ideal study case to evaluate the mobility of heavy metal. Despite a comparable whole rock geochemistry, the heavy metal content of spring waters outpouring from the various ophiolitic outcrops reveals significant differences. The highest level of total chromium are detected in spring waters circulating in naturally carbonated serpentinites whereas very low chromium amount is recorded in non-carbonated serpentinite acquifers. Moreover, beside the total chromium content, also the CrVI in the most enriched waters exceed the maximum allowed from the Italian regulation and has therefore monitored and evaluated [1]. The key factors controlling both chromium mobility and carbonation potential have to be referred to the different oceanic history of these rock bodies that led in some occurrences to the alteration of the primary Cr-bearing phases. In particular, in the ophiolitic outcrop of Montecastelli Pisano (PI), serpentinisation and subsequent modal Ca-metasomatism affecting serpentinite promoted the spinel re-equilibration and Cr transfer from Mg-Al-chromite (and chromite) to adjacent newly formed silicate phases (Cr bearing garnet and Cr-chlorite) whose are significantly more sensible to weathering. The intense Fe-brucite (and serpentine) vein crosscutting the whole serpentinites should provided a viable pattern for the CO2-rich fluids circulating in these rocks to leach out Cr, and other elements, from alteration minerals. The carbonation of the serpentinite body, mainly affecting Fe-brucite vein, led to an of increase of the porosity an therefore enhancing the mineral weathering. In addition, the massive Fe-brucite dissolution controlling carbonation, led to the formation of Mg-Fe-carbonates and Mg-Fe-Layered Double Hydroxydes (LDH) in the carbonated veins, in which CrIII can substitutes FeIII and potentially oxidized to CrVI [2].

[1] Chiarantini *et al*., (2013) *Geo. Res. Abs.* **15**, EGU2013-8839. [2] Radha & Vishnu Kamath (2004) *Bul. Mater. Sci.* **27**, 355–360.

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