Batch Tests to evaluate sulphates released in Friulan Plain water

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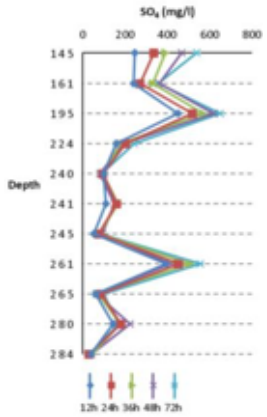
The groundwater's chemical composition is primarily influenced by the lithologic characteristics of the resorvoir. The ions concentration defines the hydrochemical facies of water. So, it possible determine release, solubilization and impact that the litology can have in groundwater.

In water of Tagliamento River's area (Pordenone, Italy), an high concentration of sulphate has been measered [1], but its cause is uncertain. Are waters coming from pre-Alps already rich in sulphates or is rainwater enriched in sulphates due to the interaction with the sediment?

To answer this question, a 368 meters deep test well was built in the Middle Friulan Plain. Samples were taken from the well and, on these, LOI, WD-XRF and Batch Tests were performed. The latter were performed every 12, 24, 36, 48 and 72 hours and allowed to analyze the interactions between deionized water and the selected samples [2]. The resulting solution was analyzed by ion chromatography.

The samples for Batch Tests were selected based on the grain size: taken from the layers of fine sandy material.



The figure 1 shows the increase of sulphates for each depth-sample in correlation with the residence time. The results show that for each sample there is an increase of the amount of sulphates, expecially for the samples at the depths 145, 161, 195 and 261.

This is a concrete prove that the high amount of sulphates recorded by the ARPA is involved in a interaction between the rainwater and the sediments.

Fig. 1: Variation of sulphates concentration with increasing contact time.

[1] ARPA Friuli Venezia Giulia (2018) https://www.dati.friuliveneziagiulia.it/Ambiente/Acqua-Acque-di-classificazione-Sotterranee/wthn-aebz/ [2] ISO/TS 21268-1:2007 Soil quality - *Leaching procedures for subsequent chemical and ecotoxicological testing of soil and soil materials -- Part 1: Batch test using a liquid to solid ratio of 2 l/kg dry matter.*