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Mobility and Speciation of Iron in the Alluvial Sheet of Nil River (North-Eastern Algerian)

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Abstract : Iron is naturally present in groundwater, it comes from the dissolution of the geological formations (clay, schist, mica-schist, gneiss...). Its chemical form and mobility in water are controlled mainly by two physicochemical parameters (Eh and pH). In order to determine its spatiotemporal evolution in groundwater, a two-monthly monitoring of the physicochemical parameters and major elements in the water of the alluvial sheet of Nil river (North-eastern Algerian) was carried out during the period from November 2013 to January 2015. The results show that iron is present in weak concentrations in the upstream part of the alluvial sheet and with raised concentrations, which can exceed the standard of potable drinking water (0.2 mg/L), in the central and downstream parts of the alluvial sheet. This variation of the concentrations is related to the important variation of Eh between the upstream part (200 mV) where the aquiver is unconfined (oxidizing medium) and the central and downstream parts (-100 mV) where the aquifer is confined (reducing medium). Iron in the oxidizing part is presented with the complexes form, where it precipitates or/and adsorbed by the geological formations. On the other hand in the reducing parts, it is released in water. In this study, one will discuss also the mobility and the chemical forms of iron according to the rains and pumping.

Keywords : groundwater, iron, mobility, speciation
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