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Characterization of the Mineralization of the Chemora Water Table (Eastern Algeria) by Geochemical and Statistical Methods

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Abstract

The Chemora region situated in the Eastern Algerian is characterized by a semi-arid climate and been a part of a region where the resource in groundwater constitutes the main source of supply. These resources are distributed between the surface water table of Mio-Plio-Quaternary and confined aquifer located in the Aptian carbonate formations. The water in the shallow aquifer is more easily accessible with wells not exceeding 50 m in depth. Therefore, the exploitation of this aquifer has been steadily increasing and levies become superior to regulatory resources. Therefore we see an average drop of groundwater level 1 m.an-1 in wells. The climate of the region is semi-arid, characterized by annual rainfall of about 270 mm and an annual average temperature of 13.2 ° C. Hydrogeochemical processes have a significant influence on the evolution of groundwater chemistry. A survey was conducted to evaluate this hydrochemical typology in a superficial aquifer located between carbonated formations and salt lake in the Chemora region being in eastern Algeria. The use of binary diagrams, thermodynamics and statistical tools was used to analyze the chemistry of this groundwater. We used chemical data of 25 water samples taken in wells drilled in this aquifer. The results indicate that the water of this aquifer is characterized by a dominant facies sulfated acquired especially by the alteration of the pyrite. The calculation of the saturation index of stability showed that groundwater becomes saturated in calcite and dolomite from one pH = 6.9 and that the latter evolves proportionally with carbonates further to the alkalinity produced in the middle. To understand the links between the geochemical and hydrogeological processes intervener in the waters of this aquifer, the samples were grouped according to their salinity into three groups in accord with the flow that allows the concentration of elements in the rows and lines of underground flow.The application of the principal components analysis showed that the acquisition of the groundwater chemistry follows two processes in the dissolution of evaporate and carbonate minerals followed by a pollution by water of irrigation.

Keywords: *Hydrochemistry, dissolution, salinity, concentration, aquifer*

Contribution of Study

This study helps to understand the mechanism of acquisition of chemistry of groundwater in connection with a salt lake.