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Origin of groundwater salinity in the Morsott-El Aouinet basin, Northeastern Algeria: hydrochemical and environmental isotopes approaches

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ABSTRACT

Due to its history, recharge–discharge mechanisms, geologic formations and the hydrodynamic characteristics, the groundwater of the Morsott-El Aouinet basin show a very wide range of chemistries. In this paper the groundwater hydrochemistry is studied through sampling from wells in the studied area. Hydrochemical members are identified and the sources of water salinization are defined. It was found that the evaporate within the Triassic rocks are the main contributors to the salinization of groundwater. The ionic speciation and mineral dissolution/precipitation was calculated by WATEQF software. The increase in salinity is related to the dissolution and/or precipitation processes during the water–rock interaction and to the cationic exchange reactions between groundwater and clay minerals. The isotopic analysis of some groundwater samples shows a similarity with the meteoric waters and indicates no significant isotopic modifications by evaporation, which means that the recharge of the aquifer is quite rapid and the residence time of meteoric water in the soil zone is short.

Keywords: Triassic; Groundwater; Salinity; Environmental isotopes; Morsott-El Aouinet; Algeria

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