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Contributions of Chemical and Isotopic Tools for Understanding the Groundwater Modes Recharge and Flow in the Lower Cretaceous Aquifer in the Moroccan Sahara

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ABSTRACT

The present work was conducted in the basin of Laayoun-Dakhla (South Morocco) to: 1) identify the recharge and flow characteristics of the Lower Cretaceous aquifer (LC); and 2) provide information about the mineralization of aquifer's water. Isotopic and hydrochemical compositions combined with the geological and hydrogeological settings were used for this purpose. The principal changes in chemical composition of LC groundwater result from mixing with water of deeper circulation. Closer analysis of available chemical data reveals the importance of dissolution/precipitation processes in evolution of groundwater chemistry. Piezometric levels, as well as chemical and isotopic composition of groundwaters, confirm hydraulic connection between the LC and the others aquifers. Overlap of some major characteristics ($\delta^{18}O$, δ^2H , Cl⁻) in this aquifer suggests that mixing processes considerably influence the hydrochemical evolution of water. The surface electrical resistivity does not indicate any freshwater-saltwater interface in the coastal aquifer and the relationship between $\delta^{18}O$ and Cl allows us to reject the hypothesis of a seawater intrusion.

KEYWORDS

Lower Cretaceous Aquifer; Arid Area; Process of Mineralization; Seawater Intrusion; Recharge and Flow

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