



Geochemical assessment and modeling of irrigation water quality of groundwater collected by wells in an arid region; case oases Bordj Ben Azzouz-Tolga-Biskra-Algeria

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Abstract

This work deals with the physicochemical quality of groundwater for irrigation agricultural land in the oasis of Bordj ben Azouz in SW Biskra. The quality of these waters is assessed by studying the physicochemical parameters of about ten water samples taken from wells and evaluating their ability to irrigate agricultural land by one of our most precious resources: water. The electrical conductivity reflects the overall salinity of the water associated with the SAR allows locating the groundwater studied in the various quality classes according to the Riverside digraph. The first group is located downstream of the BBA region, the other group upstream. We therefore have an evolution of the chemical facies of the waters in the direction of flow (from Magtoufa upstream to the Ezarga chott depression downstream), from the chlorides facies to the most dominant sulphated facies. The natural evaporation simulation of the Quaternary water table was carried out using a thermodynamic model of the Phreeqc Interactive 3.1.4-8929 software. Calculation of the saturation indices shows that the waters studied are saturated with respect to calcite, aragonite and dolomite. For the evaporate minerals, they are under saturation and it is found that the gypsum is near to saturation (steady state) leads to their precipitation, the anhydrite is also under saturated, while the halite is largely under saturated which allows it to dissolve further in the waters contributing to an increase in mineralization.

Keywords: oasis (palm grove), water irrigation, salinity, assessment,