Hydrochemistry of some wells and stable isotope evaluation,South estern desert,Egypt

Lamia Abd El Rahman Yousef

The studied area is bonded by longitudes 34º 31′ and 35º 26′ E. and latitudes 22º 19′ and 24º 51′ N. This area is characterized by radioactivity, economic resource of minerals and environmental isotopes as 2H, 18O and 3H.Fourteen representative ground water samples were collected from scattered wells in the South Eastern Desert area. Chemical analyses were carried out to determine cations, anions, trace, uranium and thorium elements, genesis, type of water, and its suitability for different purposes. Total dissolved salts of these water samples range between 396 and 7874 ppm, their alkalinity (pH) ranges between 6.5 and 8.5, and depth of water wells ranges between 1.5 and 35m.The uranium concentration is native in all samples except El Nabaa and Shnay that have 0.13 and 2.0 ppb respectively, which is also lower than the guideline for uranium in drinking water. While, the thorium concentration ranges between 0.0007 and 0.028 ppb that have within the safe limit.The hydrochemical characteristics show that, the sodium ion is the most dominant cation and chloride ion is the most dominant anion. The interpretation of the obtained graphs shows that, the ground water samples are from meteoric and marine origin. The assessments of the quality of water samples for drinking, irrigation, building, industrial purposes, livestock and poultry facilitate the use of the water in different live purposes.The environmental isotopes (2H, 18O) and radioactive isotope (3H) could be applied for water samples to focus on the origin, source of recharging, water rock interaction between an aquifers and water, factor controlling on the chemical composition, and also the age dating for the ground water. There are three different sources of recharging; paleo-water, local precipitation, and rain water. Accordingly, there are different origin water recharge samples; older, subolder, subrecent to older and subrecent recharge. The lower tritium content of studied water samples was attributed to mixing of ground water with paleo-water that absent from tritium or recharging of ground water from rain water before ”Thermonuclear bomb test-1963”.