

Variation of Chemical constituents of Ground Water Quality of Wadi Al-Rasheedia Basin/ North of Mosul City

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ABSTRACT

The shortage in water supply forced population to drill their private well and extract ground water to meet their increasing needs. The area under study is a major agricultural that supports crops such as wheat, barely, lentil and vegetable and large scale livestock operation.

The importance of chemical characteristics study of ground water lies into know the effect between lithological units and water flow, and naturally concentration of dissolved salts are increased due to natural dissolution process.

The study area is located North of Mosul city between latitudes (36 23 42 - 36 38 16) and longitudes (42 44 19 - 43 18 24). It covers an area of about 120 square Km. and fall under semi-arid climatic type. The area is characterized by well-developed dendritic type of drainage system. Tributaries is considered to be non-perennial, as it carries water during rainy period between Nov.-December.

Stratigraphically, the area under research is dominated by geological formations ranging from Middle Miocene to Quaternary.

The chemical characteristics of ground water samples in wadi Al-Rasheedia basin North of Mosul city have been study through the chemical analysis of (14) Ground water samples to evaluate the quality of ground water to determine its suitability for domestics and agricultural uses. Physical and chemical parameters of ground water samples such as Ec, pH, TDS, Na, K, Ca, Mg, Hco₃, So₄, NO₃ and Cl were determined, Na% and Sodium Adsorption Ratio (SAR) have been calculated using mathematical formulae. The pH value range between (7.1-7.36), the Ec value range between from 1500-2659)mohs, the total hardness (TH) value range from (757.1-1388.6)mg/l and total dissolved solids (TDS) value range between (1450-3000) mg/l.

Hydrochemical parameters are analyzed graphically by using Piper diagram to show the suitability, type and the geochemical evolution of the ground water. Richard and Wilcox classifications are also used to show the suitability of ground water for irrigation.

Lithological units of Al-Fatha and Injana aquifers were identified and examined from the wells have been distributed over the area of study. Ground water of the study area is replenished from rainfall and valleys draining water to the basin.

The abundance of the major ions in ground water samples in the northern part of the area, is in the following order: Ca > Mg > Na > K = HCO₃ > SO₄ > Cl > NO₃ and this leads to a mixed cation - HCO₃ type. While the ground water samples of the southern part of the area is in the following order: Ca > Mg > Na > K = SO₄ > HCO₃ > Cl > NO₃ and this leads to a mixed cation - SO₄ type of water.

Ground water chemistry of the study area indicates that most ground water samples are of CaHCO₃ and CaSO₄ water type, and have high total hardness and TDS, and generally low alkaline in nature. High to very High salinity hazards shows that ground water in the south part of the study area can be used for plants having good salt tolerance.

Keywords:- Ec, pH, TDS, TH