

HYDROGEOCHEMICAL PROCESS OF GROUNDWATER AND IDENTIFICATION OF SALINE WATER INTRUSION, NORTH CHENNAI, THIRUVALLUR DISTRICT, TAMILNADU, INDIA

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Abstract

Saline groundwater is a major problem in urbanized coastal regions of India, which largely is due to over exploitation of groundwater for various purposes. Fifty- five groundwater samples were collected during post-monsoon in 2015 and pre-monsoon in 2015. Geochemical signatures of groundwater were used to identify the chemical processes that control hydrogeochemistry. Geochemical parameters such as pH, EC, TDS, Ca⁺, Mg⁺, Na⁺, K⁺, Cl⁻, HCO₃⁻, and SO₄²⁻ were determined for both seasons. Groundwater at many locations in the study area are not suitable for drinking and domestic purpose because of its salinity, mostly due to industrial activities and urbanization. USSL diagram was used to indicate whether the groundwater quality is suitable for agriculture/irrigation. Gibb's diagram indicates that most of the samples fall in the evaporation field. The origin of Cl in groundwater may be attributed to Na-Cl- rich seawater intrusion into the aquifer. Ca+Mg vs SO₄+HCO₃ diagram suggests that carbonate and silicate weathering are the major hydrogeochemical processes operating in this region.

Keywords: Groundwater quality, Gibbs, USSL diagram, sea water