Journal of Applied Geochemistry
Vol. 17, No. 1 (2015). pp. 56-65

CHEMISTRY OF GROUNDWATER IN ERRAVAGU SUB-BASIN, GUNTUR DISTRICT, ANDHRA PRADESH

P. V. Nageswara Rao*, G. Babu Rao, A. Subrahmanyam[1], N. Subba Rao[2] and K. John Paul
Department of Geology, Acharya Nagarjuna University, Nagarjunanagar, Andhra Pradesh.
[1]Department of Civil Engineering, Malineni Perumallu Educational Society Groups of Engineering College, Pulladigunta, Andhra Pradesh.
[2]Department of Geology, Andhra University, Visakhapatnam, Andhra Pradesh.
E-mail: drpvn.rao@gmail.com

Abstract

The Erravagu sub-basin of Guntur district, Andhra Pradesh is chosen for the present study to assess the chemistry of groundwater. The study area is underlain by Peninsular Gneissic Complex of Archaean, and shales, phyllites, limestones and quartzites of middle Proterozoic age. The groundwater is of alkaline nature, fresh to brackish and moderate hard to very hard. The groundwater is not suitable for drinking as well as for irrigation in most locations. Geochemical plots suggest that the chemistry of groundwater is controlled by rock - weathering, mineral dissolution, ionic exchange reactions and evaporation. The chloroalkaline index (CAI) values also indicate the ionic exchange and base-exchange reactions are played an important in controlling the groundwater chemistry. The ionic load from anthropogenic sources appears to have caused the elevation of various chemical variables, which is responsible for brackishness of the water. Pipers' and Gibbs' diagrams also suggest that the groundwater quality is initially fresh and is subsequently modified to brackish. Therefore, the groundwater shows Na^+: HCO_3^- - Cl^- and Na^+: Cl^-- HCO_3^- water types.

Keywords: Groundwater chemistry, Erravagu sub-basin, Guntur district, Andhra Pradesh.