Journal of Applied Geochemistry
Vol. 24, No. 1, (2022). pp. 15-24

DELINEATION OF FLUORIDE BEARING GROUNDWATER ZONES, YACHARAM AREA, TELANGANA

Yadagiri Kalluri[1*] and V. Sudarshan[2]
[1]*Department of Geology, Osmania University, Hyderabad, Telangana State, India*
[2]*Department of Applied Geochemistry, Osmania University, Hyderabad, Telangana State, India*
E-mail: kalluri.giri@gmail.com

Abstract

Geochemical investigations have been carried out on 40 representative groundwater samples to understand the distribution of fluoride in the rock dominant semi-arid region of Yacharam Area, Rangareddy District of Telangana State. The study area is predominantly occupied by Archaean granites and alkali feldspar granites. Analysis was carried out for fluoride (F^-) along with major ions in both pre-and post-monsoon seasons. In the study area, nearly 78% of the groundwater from hard rock formations possess fluoride concentration more than the permissible limit of 1.5 mg/L. Microscopic analysis of rock samples in the study area confirms the presence of fluorine-bearing minerals, fluorite and apatite. Weathering of these fluorine bearing minerals present in the granites is the prominent factor contributing to higher fluoride concentration in the study area. The investigation of fluoride concentration indicates that about 78% groundwater samples fall under Zone-III and Zone-IV and, as a consequence, may lead to dental and skeletal fluorosis in consumers. Only 20% groundwater falls under Zone-I and Zone-II, which is safe for drinking in western part of the study area. A total of 36 number of villages are more fluoride prone in eastern part of the study area. Therefore, it is recommended that drinking water may be supplied from surface water reservoirs to the affected habitations so that adverse health effects can be prevented.

Keywords: Geochemistry, groundwater, granitic terrain, fluoride zones, delineation, Yacharam, India.