

Chemical Characteristics of Groundwater in the Akatsi and Ketu Districts of the Volta Region, Ghana

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Abstract

The physico-chemical characteristics of the groundwater at Akatsi and Ketu districts were investigated. Water samples were collected from 34 boreholes in the Akatsi District and 27 boreholes in the Ketu District and analysed for their quality parameters, using appropriate certified and acceptable international standard methods. Most of the water quality variables measured were within the WHO and GWCL guidelines for drinking water. The results showed that groundwater in the two districts are soft but slightly acidic with ranges 5.75–7.39 pH units and 5.14–7.15 pH units for Akatsi and Ketu districts, respectively, and mean 6.73 pH units for Akatsi and 6.5 pH units for Ketu. Groundwater in both districts were also mineralized with conductivity ranges 170–6440 $\mu\text{S}/\text{cm}$ and 420–5180 $\mu\text{S}/\text{cm}$ for Akatsi and Ketu districts, respectively, and mean 1450.9 $\mu\text{S}/\text{cm}$ for Akatsi and 1737.1 $\mu\text{S}/\text{cm}$ for Ketu. SO_4^{2-} and Cl^- ion concentrations in some boreholes in both districts were at such elevated levels that serious health effects and risks might arise after prolonged and continuous intake. The NO_3^- -N concentrations in some of the boreholes in the two districts were present at elevated levels (far above the critical value of 10 mg/l) and might cause cyanosis, a potential health risk in infants.