

Geochemistry of fluoride and arsenic in groundwater of District Vehari, Punjab, Pakistan

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Concentrations of arsenic (As) and fluoride (F⁻) have been detected in aquifers of two Tehsils of District Vehari Punjab, Pakistan. In Mailsi and Vehari As concentrations ranged from 11-828 $\mu\text{g/L}$ and 12-156 $\mu\text{g/L}$ showing 100% and 50 % samples exceeding the WHO limit, while F⁻ concentration in all samples of Mailsi were below the WHO limits (1.5 mg/L) and in Vehari 3% samples exceeded the limit with range 1.5-3.9 mg/L. The water chemistry of the area is CaMgHCO₃ type. As and HCO₃⁻ show positive correlation ($r^2= 0.444$), while significant negative correlations were found between As and Mn²⁺ ($r^2= -0.051$) and As and Fe²⁺ ($r^2 = -0.062$). Geochemical signatures of the groundwater show that the arsenic seems to be released by oxidative dissolution under the influence of high alkaline water and to some extent high arsenic concentrations are related with the high evaporation in the area.