

Geochemical and isotopic study of the groundwater flow system of Mt. Etna volcano (Italy)

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Etnean groundwaters show a predominant bicarbonate-alkaline chemistry and a minor chlorine-sulphate-alkaline composition along the coast. Other distinctive characteristics are: very high TDS, Mg usually higher than Ca and $\text{Na}+\text{Mg} > \text{Ca}+\text{K}$.

dD and d18O data indicate that all the waters sampled are of meteoric origin and seem to exclude any interaction with deeper magmatic fluids. Two large areas, characterized by a diffuse degassing of CO₂ of magmatic origin, leaking into groundwater, have been identified in the Southern and Eastern region of the volcano. High "positive" isotopic ratio (dD ~ -12 per mil and d18O ~ 10.4 per mil) suggests a very deep origin of the CO₂ rich gases and Na-Cl brines discharged by three mud volcanoes located around the town of Paterno'.