Geochemical status and interactions between soil and groundwater systems in the area of Akrefnio, Central Greece. Risk assessment, under the scope of mankind and natural environment

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Abstract: Totally 50 samples of groundwater and soil were collected from the area of Akrefnio (central Greece), in order to assess the geochemical status and the risk for humans and natural environment. The analytical results and processing of the initial data revealed that the main factors controlling hydrogeochemistry are the natural enrichment from calcareous substrate and the manmade pollution through extensive use of N-fertilizers. Soil geochemistry was mainly influenced by the occurrence of lateritic horizons, which gave raise to elevated concentrations of Ni and Cr in the majority of soil samples. Although most of the geochemical enrichment processes between soil and groundwater are common, the above geochemical systems don’t seem to interact, and act most of the times independently. Risk assessment of natural and mankind environment revealed that groundwater is suitable for drinking but not for irrigation, due to high salinity. Finally, soils are highly polluted by Ni and Cr, and thus are inappropriate for the existing agricultural land uses.

Key words: Akrefnio, central Greece, geochemistry, groundwater, risk assessment, soil