Origin of dissolved inorganic carbon of spring in Kuju and Aso volcanic area

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Origin of dissolved inorganic carbon of spring in Kuju and Aso volcanic area was discussed by means of isotopic geochemistry and hydrology.

Isotopic composition of hydrogen and oxygen, and carbon isotopic ratio of dissolved inorganic carbon (DIC) were analyzed for 78 cold spring waters, 60 cold spring waters in Kuju and Aso volcanic area, respectively.

The hydrogen and oxygen isotopic ratio demonstrate definitely approved that the major source of spring waters in Kuju and Aso volcanic area ware mainly derived from the meteoric water, but with a minor contribute of the magmatic water.

In Kuju volcanic area, the data of d13C and concentration of DIC approved that the magmatic gas mixed with some springs, however, the groundwater dissolved soil CO2 were partially added in the groundwater dissolved magmatic CO2 during water migration. DIC have generally its origin in soil CO2 in this area other than those above. Magmatic CO2 flux, which discharge from springs in this area, is estimated as 12.9 t/day in all.

In Aso volcanic area, in contrast, the data ofd13C and concentration of DIC approved that DIC of all springs had its origin in soil and atmospheric CO2.