

On the origins of nitrate and sulphate ions in urban shallow groundwater of Shakujii-gawa basin, Tokyo

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A nitrogen and sulfur isotope study was carried out for both groundwater samples, and various kinds of fertilizers and detergents, to discuss possible origins of nitrate and sulfate ions in shallow groundwater of the highly-urbanized Shakujii-gawa basin on the Musashino plateau, Tokyo, Japan. Nitrogen and sulfur isotope measurements suggest contribution of the end-member with high isotopic values such as organic fertilizers used in field cropping, miscellaneous household waste water once infiltrated into the soils, and/or leaking sewage from aging, deteriorated sewer pipes, accounting for high nitrate and sulfate concentrations in shallow groundwater of the Shakujii-gawa basin.

Keywords: urban groundwater, nitrate ion, sulfate ion, origin of ions, isotopes