

The relation between the variations of groundwater body and the hydrochemical processes of the baseflow in a forest catchment

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The spatial variability of groundwater chemistry, volume and the baseflow hydrochemistry were observed in a forest basin. Comparing the SiO₂ concentration of baseflow, shallower and deeper groundwater, the concentration of baseflow always intermediate between that of shallower and deeper groundwater. The concentration of the shallower groundwater decreased with rainfalls, and that of deeper groundwater was constant and that of baseflow varied little. The shallower groundwater was diluted with the mixing of the component that had the lower concentration when the groundwater volume increased, but the deeper groundwater was not affected. The groundwater chemistry affects to the baseflow chemistry and the discharge of these groundwater components is largely affected by the groundwater volume.

Hydrochemical observations were conducted in a forest catchment in order to clarify the relation of the spatial variability of groundwater chemistry, the variations of groundwater body and the hydrochemical processes of the baseflow. The SiO₂ concentrations were increased along with the infiltration and flowing processes and distributed inhomogeneously within the groundwater body. Comparing the temporal variations of SiO₂ concentration of baseflow, shallower groundwater and deeper groundwater of 2000, the concentration of baseflow was always higher than that of shallower groundwater and lower than that of deeper groundwater. The concentration of the shallower groundwater decreased with rainfalls, and that of deeper groundwater did not fluctuate. The concentration of baseflow varied little. The SiO₂ concentration of shallower groundwater was decreased with the increase of the groundwater volume. That is, the shallower groundwater was diluted with the mixing of the water component that had the lower SiO₂ concentration when the groundwater volume increased, but the deeper groundwater was not affected by that water component and the concentration did not change. The chemistry of the shallower and deeper groundwater components contributes to the baseflow chemistry and the discharge of these water components is largely affected by the expansion and reduction of the groundwater body.