

Relationships between water quality of shallow groundwaters and geology in Okayama Prefecture

Toshihiko Matsuda[1], koji Nagano[2]

[1] Earth Sci., Okayama Univ, [2] Depart. Earth Sci., Okayama Univ.

The concentrations of major constituents were measured in 175 water samples from shallow wells and springs in Okayama Prefecture. Many kinds of igneous, sedimentary and metamorphic rocks distribute in the investigated area. Igneous rocks are granite, rhyolite, andesite, diorite, basalt and gabbro. Sedimentary rocks are mudstone, shale, sandstone, conglomerate and limestone. Metamorphic rocks are pelitic schist, psamitic schist, greenschist, metadiorite and metagabbro. Present study was performed in order to consider the relationships between water quality of shallow groundwaters and geology.

The following results were obtained.

1. The water quality of shallow wells and springs is largely affected by surrounding rocks.
2. Almost of well and spring waters in Okayama Prefecture showed the water types of Ca-HCO₃, CaNa-HCO₃ and CaNa-HCO₃Cl.
3. Ca + Mg ratios of waters from granite, granodiorite, rhyolite and basic volcanic rocks in the area were somewhat higher in piper diagram than the other regions.
4. Some waters contained considerable amounts of fluorine from southwestern regions of the prefecture. There are some ore deposits where fluorite often occurs. High contents of fluorine may be caused by weathering of the mineral and/or F-bearing biotite.
5. Weathering of plagioclase affects largely the constituents of water in basic volcanic rocks like basalt (Tamari et al. 1988).
6. Concentration of Ca + Mg of waters from granite, rhyolite and basic volcanic rock was higher than that of the other regions. It may be caused by the amounts of mafic minerals in the host rocks.