

## Geochemistry of Groundwater in the Hakozaki -Hakomatsu Area, with Special Reference to Fluorine Contamination.

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The purpose of this study is to clarify both the water quality of groundwater and the geology of the aquifer, especially in relation to the distribution and origin of fluorine.

He collected 35 water samples at the wells in the area, and analyzed the concentration of fluorine and main elements. He also collected borehole column data of the area, and compiled the geology.

Results are summarized as follows:

1. The geology of this area is divided into 4 units which in ascending order are the Tertiary basement, overlain unconformably by gravel bed of Pleistocene, marine clay bed (Hakata silt bed) of Holocene and sand bed (Hakozaki sand bed).
2. The aquifer is entirely the Hakozaki sand bed which lies nearly horizontally. It has a thickness of 5-6 m.
3. Qualities of groundwater in the area are mostly plotted in the  $\text{Ca}^{2+}\text{-HCO}_3^-$  type on the trilinear diagram, which corresponds to normal and shallow groundwater type in Japan.
4. The high fluorine content of 2.3mg/L is detected only at one well (No.19), which is the same well reported by Fukuoka City (2001). Its water is classified into  $\text{Na}^+\text{-Cl}^-$  type, which is quite different from others.
5. The groundwater of No.19 also contains higher-concentration of  $\text{Na}^+$ ,  $\text{Cl}^-$ ,  $\text{SO}_4^{2-}$  and  $\text{HCO}_3^-$  than other wells.
6. From the chemical characteristics of groundwater and also the existence of a woodworking plant close to the No.19 well, it is concluded that the high-fluorine bearing groundwater in question is due to contamination by a water-soluble antiseptic such as sodium fluoride which is widely used for preservative treatment on timber.