

Temporal variations in the chemical composition of the depth water in Miyagi prefecture

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Many abnormal phenomena of groundwater within earthquake are reported. Mainly there are temperature of groundwater, the water groundwater level and amount of groundwater discharge. Furthermore the concentrations of radon in groundwater are investigated as geochemical observation of earthquake. In Hyogoken Nanbu earthquake (1995), however investigation of commercial bottled water after the earthquake, it was reported changes of dissolved chemical components such as chloride ion before earthquake. Then in this study, I attempted geochemical observation of earthquake by investigating chemical components (Cl^- , SO_4^{2-} , Na^+ , Ca^{2+} , Mg , K , Sr) in deep-groundwater at three points of Miyagi prefecture.

The deep ground water of Naruse town Nobiru in the north of Miyagi prefecture was started investigating temporal variations in chemical composition from October in 2003. In this place the concentrations of several ion fluctuated from October to December in 2003 and after October 24 in 2004. The fluctuation of ion concentration from October to December in 2003 was possibly affected by Miyagi Hokubu earthquake (July 26 in 2003(M5.3)) or foreshocks of its earthquake. The fluctuation of ion concentration after October 24 in 2004 was probably affected by Nigataken Chuetsu earthquake (October 23 in 2004(M6.8)).

The deep ground water of Sendai city Nisikigaoka in the west of Sendai was started investigating temporal variations in chemical composition from October in 2003. In this place the concentration of several ion increased in December 2003. This increasing of ion concentration was possibly affected by earthquake occurring directly before starting investigation or by Miyagi Hokubu earthquake.

The deep ground water of Sendai city Atago in the central Sendai city was started investigating temporal variations in chemical composition from September 2004. In this place the ion concentration decreased gradually from September 20 to mid-October. After that it increased gradually to early November and backed to ion concentration of early September.

These chemical composition changes of deep groundwater maybe occurred due to a transition of groundwater system. And this transition of groundwater system was attributed to permeability enhancement for occurrence crack in crust with earthquake.