Geological Study of Groundwater in Tono area, Gifu Pref.,Japan

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1.Introduction

Some natural-analogue studies of Tono-area have been done. To complete natural-analogue study, one of the most important task is to know ground water. Only few studies from geochemical and geological points of view for the purpose of the interpretations of the ground water quality have been carried out. Therefore, many systematic analysis of the ground water from drilling cores were done.

2.Experimental

Ground water samples from drilling cores (MSB2, MSB4) in Tono area, have been analyzed by pH meter, ion chromatography, atomic absorption spectrophotometer. Rock samples from MSB2 have been analyzed by X-ray fluorescence (XRF) and X-ray diffraction (XRD) methods.

3.Results

Comparing the analytical data with the compositions of seawater and meteoric water, the composition of groundwater was different from seawater. To say, the groundwater composition has been changed by long-term rock-water reactions.

Main reactions of rock-water reactions are thought to be ion exchange, dissolution precipitation and adsorption. To know which reactions have contributed to the composition, a few studies have been done. But the results cannot be categorized into such groups. Additionaly, there were differences with the depth. Thus both of these reactions are contributed to the composition.

Then we need more discussion about dissolution precipitation. The theory which based on chemical equilibrium can make the boundary line between kaolinite and Ca-montmorillonaite on figure (log mH4SiO4 , log mH4SiO4 diagram). The data was plotted near the boundary line, and this results coincide with the previous study by Yamakawa (1991), indicating chemical equilibrium between kaolinite and Ca-montmorillonaite.