Japan Geoscience Union Meeting 2013
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AHW26-P01 Room:Convention Hall Time:May 23 18:15-19:30

Atmospheric SF6 mixing ratios around the Japanese archipelago

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Sulfur hexafluoride (SF6) is a promising transient tracer for young groundwater dating, but elevated levels of atmospheric SF6 may limit application of this dating method in urban areas. To determine the magnitude of this limitation within Japan, we measured the atmospheric SF6 mixing ratios around Nagoya, Osaka and Tokyo.

Keywords: Sulfur hexafluoride, Atmosphere, Japan, Urban aea, Groudwater age

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AHW26-P02 Room:Convention Hall Time:May 23 18:15-19:30

Estimation of residence time for submarine spring in the Chokai volcano

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Mt. Chokai, located on Tohoku area is a stratovolcano and has the submarine spring. The submarine spring distribute around the west coastal area of Chokai volcano. In this study, we applied the multi tracer method, to understand the origin and age for the submarine spring.

Keywords: Chokai volcano, submarine spring, residence time, transient tracer

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AHW26-P03 Room:Convention Hall Time:May 23 18:15-19:30

Preliminary study on contribution of volcanic gas to springs in the Chokai volcano

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The Mt. Chokai is a volcano located on the boundary of Akita and Yamagata prefectures, Japan, and faces the Sea of Japan. There are a lot of springs not only in slope and foot of the mountain but also on the sea floor. Springs mainly distribute in the western slope and foot on the mountain. While, the Detsubo spring is located in the northern slope and shows large flux (from 0.2 to 0.4 m^3/sec; Shimano and Hida, 2001) despite it discharges from higher elevation (about 560 m). Since the Detsubo water shows low pH ($<$ 5) and high SO_4^{2-} concentration ($>$ 50 mg/L), contribution of volcanic gas to the spring water is estimated (Inoue, 1993; Shimano and Hida, 2001; Shimano, 2003; Ogasawara, 2005; Amita, et al., 2007). However, geochemical process to form water quality is still not clear. Ogasawara (2005) suggested the contribution of the volcanic gas to other several springs based on delta^{13}C. This study attempts to reveal the contribution of the volcanic gas to spring waters, especially to the Detsubo spring.

Spring water samples were collected on August 2012, and were analyzed for major dissolved components, delta D, delta^{18}O, delta^{13}C, ^{3}He/^{4}He, noble gas concentrations and groundwater-age indices (CFCs and SF_6). Results of major dissolved components and delta D and delta^{18}O showed almost same values with previous studies. Dissolved components of the most spring water showed Na-Cl/HCO_3 type, while the Detsubo spring showed Na-Cl/SO_4type. Correlation of delta D and delta^{18}O showed that all samples were plotted along the meteoric water line, suggesting that the contribution of magmatic water to groundwater is unlikely or less. delta^{13}C values ranged from -15.3 to -4.3 permil and tended to show higher values than those values obtained by Ogasawara (2005). Only the Detsubo spring and two springs ranged from -5 to -4 permil. Dissolution of marine carbonates is considered to be quite small because spring waters are recharged and flow in volcanic aquifer. This result suggests volcanic gas contributes not only to spring water of Na-Cl/SO_4 type but also to spring water of Na-Cl/HCO_3 type. In the presentation, contribution of volcanic gas to spring water and difference of dissolved components will be discussed based on results described above and He isotopes.

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Identification of groundwater recharge on Midaigawa-alluvial fan

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In this study, the hydrogen and oxygen stable isotopes (D and 18O) and chemical compositions of water were employed to the estimation of contribution ratios of groundwater recharge sources in western Kofu basin of central Japan. The study area is Midaigawa alluvial fan, which is formed by Raised-bed River discharged from the mountain watershed.

The groundwater collected from 25 deep wells (100˜300m) in June-2010, Novenber-2011 and Novenber-2012. Those wells were located on Midaigawa alluvial fan and adjacent mountain. The precipitation and main river water also collected from this area. End-member mixing analysis using isotope value and chloride concentration revealed spatial variation in the contribution ratios for various groundwater sources. This presentation will be focus on groundwater recharge from mountain area to alluvial fan.

Keywords: Groundwater recharge, Alluvial fan, Stable isotopes, End-member mixing analysis