Chemistry of thermal water and river water in the western area of the Hachimantai, Akita Prefecture, Japan

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Abstract

The Ohbuki thermal water of the Tamagawa hot spring having arsenic content of 1.8 ppm flows into the Shibukuro stream through the Yukawa stream and Tamagawa Neutralization Plant. The thermal water runs down the Tamagawa River through the Shibukuro stream. The purpose of this study is to clarify the mode of occurrence of arsenic in stream water of the Shibukuro stream and Tamagawa River. The values of pH of river water of the Shibukuro stream and the Tamagawa River change from 2.6 to 6.3. Arsenic contents in the stream water of the Shibukuro stream decrease from the confluence point with the Ohbuki thermal water to the merging point with the Shibukuro stream and the Tamagawa River. The suspension particles identified by TEM in the stream water are mostly composed of amorphous iron hydroxide, schwertmannite and barite. Occurrence of arsenic in the amorphous iron hydroxide is also confirmed by semi-quantitative analyses by TEM. Based on these facts, arsenic in the stream water is removed from the stream water as absorbed element on the surfaces of amorphous iron hydroxide, and arsenic is transported to the downstream area of the Tamagwa River.