

## Research on Ore and Mineral Specimens in the Edo Period, from Iwami Ginzan Silver Mine, Japan

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The ore and mineral specimens from the Iwami Ginzan Silver Mine in the Edo period were found in Omori, Ohda City, Shimane Prefecture, Japan. Currently, there are 58 ore specimens in the Iwami Silvermine Museum, out of which 24 are wrapped in paper. The wrapping paper contains information pertaining to the name of ore or minerals from the Edo period, place of sampling, sampler, date of collection, and quality. The ore specimens mined in the Edo period are rare and thus valuable. The specimens of this study are very rare cases with ancient document information that are accompanied by academic values such as historical materials and cultural properties, which is considered highly valuable. These ore specimens were analyzed using X-ray powder diffractometry (XRD), energy-dispersive X-ray spectroscopy (EDS), and scanning electron microscopy (SEM). As a result, silver ore minerals such as native silver, argentite (acanthite), and tetrahedrite were found. We thoroughly read the old document to verify it.

In the early Edo period, Japan produced a large amount of gold and silver and used these abundant resources for trade. Japan's silver production accounted for approximately one-third of the worldwide production in the 16th and 17th centuries, and majority of Japan's production occurred at the Iwami Ginzan Silver Mine. Silver production at the Iwami Ginzan Silver Mine was one of the largest in the world during the time. However, only few silver ores, produced from this mine in the Edo period, are said to currently exist because of the heavy restriction and control on silver ores by the Tokugawa Shogunate of Japan.

The ore specimens introduced in this research were collected by the Takahashi family who was the "Yamashi" (manager) of Iwami Ginzan Silver Mine. It is presumed that the ores were mined later in the Edo period. The specimen is contained in a wooden box with a length of 31.2 cm, a breadth of 21.5 cm, and 4.0 cm from top to bottom. The box, stacked in three tiers, is internally partitioned into meshes (6 × 4) with a side of 4.3 cm. In this specimen group, various ores with high historical and cultural property value, including the high-quality silver ore "fukuishi" (the ore containing native silver), are collected.

This study suggests that these traditional ore and mineral specimens will provide a significant clue in clarifying the situations and methods of silver production in the Iwami Ginzan Silver Mine in the Edo period.

Keywords: Iwami Ginzan Silver Mine, ore specimens, mineral, silver, the Edo Period, Shimane