

**Tanaka Kikinzoku Kogyo to Begin Joint Development of Silver Analysis Technology Aiming at Establishing Global Standard with Japan Mint**

Aiming at accreditation of ISO/IEC17025 Certification by optimizing Silver Analysis Technology under way

Tanaka Kikinzoku Kogyo K.K.<sup>\*1</sup> (Head office: Chiyoda-ku, Tokyo; President & CEO: Hideya Okamoto) will begin a joint development of silver analysis technology with Japan Mint, an Incorporated Administrative Agency in Japan.

The purpose of the joint development is to demonstrate the validity of analysis method and its value each other and to strengthen an individual analysis technology possessed by each party by both exchanging technical information and sharing experimental data. In general the method of silver analysis will vary depending on its grade. Tanaka Kikinzoku Kogyo will develop analysis technology for 24 key elements<sup>\*2</sup> that should be analyzed as impurities in silver in order to analyze the high-purity silver used in industrial products, while Japan Mint will develop analysis technology for measuring the purity of silver itself in order to analyze high-purity silver used in commemorative coins and the silver alloys recently used in various ornaments.

The duration of the joint development is scheduled to be one year, and each of Tanaka Kikinzoku Kogyo and Japan Mint will aim to obtain ISO/IEC17025:2005<sup>\*3</sup> certification for the silver analysis technology they develop respectively, alternatively try to reach the required technological level by the end of 2013. This is expected to contribute to the establishment of a global standard for silver analysis, which has been considered difficult in the past.

**■ Current State of Silver Analysis Method**

In case of dissolving silver for analysis, nitric acid is applicable, instead of the aqua regia<sup>\*4</sup> being generally used for dissolving other precious metals. This is because dissolving silver in aqua regia produces silver chloride which may hinder the manipulation for determine the grade of silver. However, if an element such as gold is contained when dissolving silver with nitric acid, it remains undissolve. In this case, this makes the analysis of silver more difficult than that of other precious metals.

It has been confirmed that the function of high-performance industrial products that require high-purity silver is affected if they contain even trace amounts of certain elements, and both customer demand and market requirements for silver analysis are increasing. Because of this, Tanaka Kikinzoku Kogyo, which handles many such industrial products, has recently utilized a method for establishing the purity of silver through the subtraction method by using nitric acid to dissolve 24 key elements contained in silver to be assessed using an ICP Optical Emission Spectrometer<sup>\*5</sup> in accordance with LBMA<sup>\*6</sup> guidelines. This method uses a mixture of hydrochloric acid and nitric acid to dissolve the impure elements not being dissolved by nitric acid, and the concentration of each impure element is calculated by assessing the two different solutions, making it suitable for the analysis of high-purity silver. However, errors may increase when the concentration of impurities is low, and further improvements need to be made to analysis technology in order to establish the amount of each element contained.

Meanwhile, Japan Mint uses a method (potentiometric titration) for measuring silver itself by dissolving silver with nitric acid and titrating this using a sodium chloride solution in accordance with JIS H 6311<sup>\*7</sup>. This analysis method is suitable for analyzing the silver alloys used in ornaments, etc. However, the diversification of the design and composition of silver ornament material in recent times has led to cases in which undissolved material remains in

the process of dissolving silver with nitric acid, and as it is believed that it is necessary to perform analysis on silver ornaments outside the applicable range of JIS H 6311 (75-95%) and high-purity coins, further improvement of analysis technology is required.

### ■ Demand for Improvement of Silver Analysis Technology

Various grades of silver are currently used in items ranging from industrial products such as contact material, sputtering targets and solar cell electrodes to consumer items such as ornaments and collector's items such as coins commemorating the 60<sup>th</sup> anniversary of the enactment of the Local Autonomy Act. Under these circumstances, the rise in precious metal prices in recent years has led to silver being extracted not only from mines but also recycled items, making the development and establishment of more accurate and rapid analysis methods a pressing issue.

Tanaka Kikinzoku Kogyo is one of the five companies in the world that has been accredited by the LBMA as one of five Good Delivery Referees able to assess the quality of silver bullion, and is endeavoring to maintain and improve Good Delivery silver in the market. Meanwhile, in addition to its analysis of coins containing gold and silver performed as the only Mint issuing coins in the country, Japan Mint contributes to the protection of consumers by analyzing and guaranteeing Precious Metal Wares in Japan through the country's only one official issuer of Fineness Certification and Mint Certification Marks of Precious Metals Wares. This joint development is aimed at optimizing silver analysis methods deemed to be difficult in the past and further improving the reliability of silver analysis by combining the diverse precious metal analysis experience and research facilities spanning from procurement to manufacture and recovery of precious metals that Tanaka Kikinzoku Kogyo has developed to date with the objective analysis technology and experience required by customers inside and outside Japan that Japan Mint has accumulated over the years.

Both organizations will continue with joint development of silver analysis, while merging their expertise on analysis methods for other elements in an effort to establish the industry standard inside and outside Japan through further exchanges of information.

#### <Glossary>

\*1 Tanaka Kikinzoku Kogyo K.K.

The core company conducting manufacturing operations in the Tanaka Precious Metals Group, which has Tanaka Holdings Co., Ltd. as its holding company.

\*2 The 24 elements are aluminum, gold, arsenic, bismuth, calcium, cadmium, cobalt, chromium, copper, iron, indium, magnesium, manganese, nickel, lead, palladium, platinum, rhodium, antimony, selenium, silicon, tin, tellurium and zinc.

\*3 ISO/IEC17025:2005

An international standard specifying the general requirements concerning the ability to perform testing and calibration that requires not only the operation of management systems such as those specified in ISO 9001, but also that the subject of investigation is technically qualified and has the ability to produce suitable results.

\*4 Aqua regia

A liquid mixture of concentrated hydrochloric acid and concentrated nitric acid in a ratio of 3:1 by volume.

\*5 ICP Optical Emission Spectrometer

An analysis device able to identify and quantify elements dissolved in a solution by analyzing the optical spectrum emitted when elements that are atomized and excited by putting them into a high-temperature state called plasma return to their ground state.

\*6 LBMA

Acronym for the London Bullion Market Association. The registered accreditation organization of the London gold and silver market. It is the world's highest authority in gold and silver markets.

\*7 JIS H 6311

A method for quantifying the silver contained in silver used in jewelry.

■ **Tanaka Holdings Co., Ltd. (Holding company of Tanaka Precious Metals)**

Headquarters: 22F, Tokyo Building, 2-7-3 Marunouchi, Chiyoda-ku, Tokyo

Representative: Hideya Okamoto, President & CEO

Founded: 1885

Incorporated: 1918

Capital: 500 million yen

Employees in consolidated group: 3441 (FY2009)

Net sales of consolidated group: 710.2 billion yen (FY2009)

Main businesses of the group:

Manufacture, sales, import and export of precious metals (platinum, gold, silver, and others) and various types of industrial precious metals products. Recycling and refining of precious metals.

Website: <http://www.tanaka.co.jp>

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Headquarters: 22F, Tokyo Building, 2-7-3 Marunouchi, Chiyoda-ku, Tokyo

Representative: Hideya Okamoto, President & CEO

Founded: 1885

Incorporated: 1918

Capital: 500 million yen

Employees: 1,599 (as of March 2010)

Sales: 388.8 billion yen (as of the financial closing at the end of March 2010)

Businesses:

Manufacture, sales, import and export of precious metals (platinum, gold, silver, and others) and various types of industrial precious metals products. Recycling and refining of precious metals.

Website: <http://pro.tanaka.co.jp>

**About the Tanaka Precious Metals**

Established in 1885, the Tanaka Precious Metals has built a diversified range of business activities focused on the use of precious metals. On April 1, 2010, the group was reorganized with Tanaka Holdings Co., Ltd. as the holding company (parent company) of the Tanaka Precious Metals. In addition to strengthening corporate governance, the company aims to improve overall service to customers by ensuring efficient management and dynamic execution of operations. Tanaka Precious Metals is committed, as a specialist corporate entity, to providing a diverse range of products through cooperation among group companies.

Tanaka Precious Metals is in the top class in Japan in terms of the volume of precious metal handled, and for many years the group has developed and stably supplied industrial precious metals, in addition to providing accessories and savings commodities utilizing precious metals. As precious metal professionals, the Group will continue to contribute to enriching people's lives in the future.

The eight core companies in the Tanaka Precious Metals are as follows.

- Tanaka Holdings Co., Ltd. (pure holding company)
- Tanaka Kikinzoku Kogyo K.K.
- Tanaka Kikinzoku Hanbai K.K.
- Tanaka Kikinzoku International K.K.
- Tanaka Denshi Kogyo K.K.
- Electroplating Engineers of Japan, Limited
- Tanaka Kikinzoku Jewelry K.K.
- Tanaka Kikinzoku Business Service K.K.