

February 21, 2018

Tanaka Precious Metals

Tanaka Holdings Co., Ltd.

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## **TANAKA to Exhibit at FC EXPO 2018**

First exhibition of a catalyst coated membrane for evaluating electrode catalysts  
for water electrolysis

Tanaka will present initiatives to realize a hydrogen-based society.

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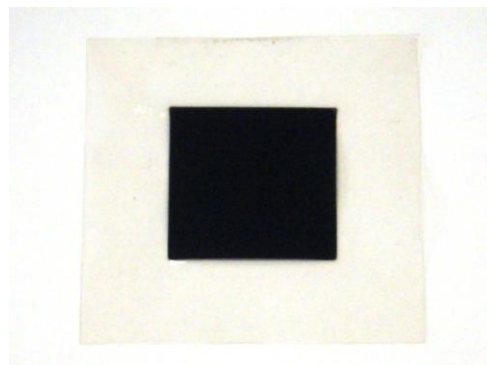
Tanaka Holdings Co., Ltd. (Head office: Chiyoda-ku, Tokyo; Representative Director & CEO: Akira Tanae) today announced that Tanaka Precious Metals, Tanaka Kikinzoku Kogyo K.K. (Head office: Chiyoda-ku, Tokyo; Representative Director & CEO: Akira Tanae), which operates the Tanaka Kikinzoku Group manufacturing business, will exhibit at “FC EXPO 2018—14th International Hydrogen and Fuel Cell Expo,” one of the world’s largest fuel cell exhibitions, which will be held at Tokyo Big Sight from Wednesday, February 28 until Friday, March 2, 2018.

As more and more renewable energy is introduced worldwide, it is becoming essential to have large-scale electricity storage technology that can store excess electricity over long periods of time, from several hours to several months. One such technology gaining attention as a front-runner is “power-to-gas,” which effectively uses excess electrical energy to produce hydrogen via water electrolysis. The produced hydrogen can be used as fuel for fuel cell vehicles and stationary fuel cell batteries. Hydrogen can react with CO<sub>2</sub> to convert into methane which can be used as a substitute natural gas or for industrial purposes such as hydrogen refineries or steel works. Therefore, investigations are underway into a diverse range of uses for this technology. Power-to-gas verification projects have been conducted at various sites worldwide since the 2000s, mainly in Europe, and it is anticipated to become a key technology for expanding renewable energy around the globe.

Tanaka Kikinzoku Kogyo supplies electrode catalysts that are used in a single high polymer water electrolysis, an important technology for power-to-gas conversions. As a new initiative to promote research and development of water electrolysis technology, the company will begin to provide samples of catalyst coated membrane (CCM) for evaluation. The provision of this CCM for evaluation in accordance with the design requirements will make it possible for our business partners, particularly equipment and infrastructure manufacturers, to shorten the period of time for technological development. Moreover, this CCM has strong catalyst properties, and so its use as a benchmark will contribute to the development of more efficient single high polymer water electrolysis equipment. At FC EXPO 2018, Tanaka will exhibit the electrode catalysts and evaluation CCM, along with detailed explanations in panel exhibits.



Artist's impression of booth



Tanaka Kikinzoku Kogyo's evaluation CCM for R&D

For the fuel cell system, a reforming catalyst PROX catalyst and palladium alloy hydrogen permeable film, etc., used in current hydrogen refining will also be displayed. This will focus on typical household stationary fuel cells (ENE-FARM) and Polymer Electrolyte Membrane Fuel Cells (PEFC) electrode catalysts for fuel cell vehicles. At the booth, technicians can explain about their work using precious metals related to fuel cell technology which are necessary for a hydrogen-based renewable energy society.

Based on the international framework provided by the Paris Agreement, which was adopted at the COP21 with the purpose of eliminating greenhouse gases, energy trends are turning away from fossil fuels across the globe. Hydrogen energy is positioned as a central technology in this movement. Amid these global trends, Tanaka Kikinzoku Kogyo will continue to engage in the development of new technologies and contribute to the realization of a hydrogen-based society as a leading company in precious metal products.

## Overview of FC EXPO 2018—14th International Hydrogen and Fuel Cell Expo booth

- Dates: 10 a.m.–6 p.m., February 28 (Wed.) to March 2 (Fri.), 2018 (closes at 5 p.m. on final day)
- Venue: Tanaka Kikinzoku Kogyo Booth, Tokyo Big Sight (W19-73)
- Main contents of exhibit:

Electrode catalysts for water electrolysis Evaluation CCM	These electrode catalyst are used as anodes (oxygen generation electrode) for water electrolysis. The catalyst has a large relative surface and low oxygen generating over voltage. The evaluation CCM used in the catalyst can be utilized as a standard membrane for electrolysis performance.
Electrode catalysts for fuel cells	We combine precious metal catalyst technologies and electrochemical technologies, cultivated over many years, in the development of highly active catalysts for fuel cell cathodes, and catalysts with excellent carbon monoxide (CO) poisoning resistance for fuel cell anodes.
Palladium alloys, hydrogen permeable films	In fuel cell hydrogen production, we utilize palladium, which is the only metal that solely allows the permeation of hydrogen gas so that impure gases are removed from hydrogen gas materials.  With Tanaka Kikinzoku Kogyo's ultra-thin film processing technology and high purification technology, we are able to offer purified hydrogen gas that is highly reliable with maximum hydrogen permeability.
Exhaust gas purifying catalysts	Catalysts for the purification and deodorization of impure gases resulting from the hydrogen purification process. Metal honeycomb catalysts that support precious metal catalysts are used in order to enable low-temperature combustion.
Reforming catalyst	A reforming catalyst is used to generate hydrogen from hydrocarbon such as natural gas.  Currently, the company is developing vapor reforming catalysts focusing on methane, which is a chief component of natural gas. Ruthenium is used to inhibit carbon deposition and platinum-rhodium is used to inhibit vice-generative production. Moreover, as activity can be maintained in a wide range of temperatures and strong activity can also be maintained with a low precious metal carried volume, the catalyst can be supplied at low cost.
Precious metal compounds	Precious metal compounds are used in numerous industrial fields as plating chemicals and catalysts. Tanaka Kikinzoku Kogyo can flexibly produce a range of products from general compounds such as gold potassium cyanide and palladium chloride to organic precious metal compounds according to the use under comprehensive quality control systems.
PROX catalysts	These catalysts use oxygen to selectively remove the carbon monoxide from reforming gas used in fuel cells. They feature high activity at a wide range of temperatures, from low to high, and even at a high space velocity, thanks to the high dispersion of precious metals that enables us to reduce precious metal loadings and offer low cost products.

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

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

Representative: Akira Tanae, Representative Director & CEO

Founded: 1885

Incorporated: 1918\*

Capital: 500 million yen

Employees in consolidated group: 5,120 (FY2016)

Net sales of consolidated group: 1,064,259 million yen (FY2016)

Main businesses of the group:

Strategic and efficient group management and management guidance to group companies as the holding company at the center of the Tanaka Precious Metals.

Website: <http://www.tanaka.co.jp/english> (Tanaka Precious Metals),

<http://pro.tanaka.co.jp/en> (Industrial products)

\* Tanaka Holdings adopted a holding company structure on April 1, 2010.

## ■Tanaka Kikinzoku Kogyo K.K.

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

Representative: Akira Tanae, Representative Director & CEO

Founded: 1885

Incorporated: 1918

Capital: 500 million yen

Employees: 2,269 (as of March 31, 2017)

Sales: 1,059,003.329 million yen (FY2016)

Main businesses:

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

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

### <About the Tanaka Precious Metals>

Since its foundation in 1885, the Tanaka Precious Metals group has built a diversified range of business activities focused on precious metals. Tanaka is a leader in Japan in terms of the volumes of precious metals handled. Over the course of many years, Tanaka Precious Metals has not only manufactured and sold precious metal products for industry, but also provided precious metals in such forms as jewelry and resources. As precious metals specialists, all Group companies within and outside Japan work together with unified cooperation between manufacturing, sales, and technological aspects to offer products and services. In addition, in order to make further progress in globalization, Tanaka Kikinzoku Kogyo welcomed Metalor Technologies International SA as a member of the Group in 2016.

As precious metal professionals, Tanaka Precious Metals will continue to contribute to the development of an enriching and prosperous society.

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

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

<Press inquiries>

Tanaka Holdings Co., Ltd.

<https://www.tanaka.co.jp/en/protanaka/inquiry/index.php>