

[Product Information] Launch of reagent sales of Platinum-loaded CNovel™ "MH-18-PT50", electrocatalyst for fuel cells

March 31, 2021

Launch of reagent sales of Platinum-loaded CNovel™ "MH-18-PT50", catalyst for fuel cells

Toyo Tanso Co., Ltd. (Head office: Osaka, Chairman/ President/ CEO : Naotaka Kondo hereinafter referred to as "Toyo Tanso") and N.E. CHEMCAT Corporation (Head office: Tokyo, President/Representative Director : Maturu Kushida hereinafter referred to as " N.E. CHEMCAT ") have been working together on the development of electrocatalysts for fuel cells. In order to meet the growing needs of the expanding fuel cell market, Toyo Tanso has commercialized a new platinum-loaded electrocatalyst for the fuel cell market, CNovel™ "MH-18-PT50", which will be available as a reagent from April 1, 2021.

Fuel cells are currently used in applications such as stationary (Residential) and FCV. With the continued exploration of hydrogen as a clean source of energy, further improvements in performance, lifespan, and costs are needed for expanded use of fuel cells. This is resulting in the increased need for effective use of platinum catalyst, a key material for fuel cells.

CNovel™, a product of Toyo Tanso, is a porous carbon powder material with a unique pore structure known as interconnected pores. In order to improve the electrochemical properties of the material, a unique heat treatment technique has been applied to enhance its functionality, and it has proven to be a high-performance catalyst support for fuel cells. [Fig.1]

N.E. CHEMCAT possesses advanced catalytic technology and has succeeded in producing highly functional catalyst particles by optimally dispersing and loading platinum nanoparticles into the pores of CNovel™, taking advantage of its unique structure. [Fig.2]

We are pleased to announce the availability of reagents to facilitate the use of these highly functional catalyst particles.

N.E. CHEMCAT will continue to work with Toyo Tanso for the further improvement and to stabilize the supply of CNovel™ -based fuel cell catalysts in anticipation of future growth in demand.

This product, CNovel™ provides higher catalytic performance and higher durability compared to the conventional catalysts support (e.g., carbon black). [Fig.3, 4 and 5]

It also contributes to lowering the cost of fuel cell systems, as the catalyst are dispersed and arranged optimally, and the performance can be stabilized even with a lower amount of catalyst than conventional products.

Toyo Tanso's new reagent allows users easier to obtain the platinum-loaded CNovel™ products, MH-18-PT50 and the advantages the products offer.

[Definition of Terms]

Inter-connected pores: A structure consisting of mesopores (2 to 50 nm in diameter) connected to each other

[Major Applications]

Electrocatalysts for fuel cell, platinum-based chemical catalysts

[Main Features and Advantages]

1. Platinum loaded CNovel™ products can be used as a catalyst without any additional process.
2. Higher catalyst performance and durability compared to conventional catalyst (e.g., carbon black).
3. Reduced amount of loaded platinum by optimal dispersion and arrangement.

[Production/Sales Plan]

Production base of CNovel™: Toyo Tanso Co., Ltd (Kondo Teruhisa Memorial Advanced Carbon Technology Center, Osaka City, Osaka)

Production base of catalyst: N.E. CHEMCAT Corporation (Tsukuba Plant, Bando-City, Ibaraki)

Production schedule: 1 kg sample per month (Contact Toyo Tanso to request amounts greater than 1 kg per month.)

Scheduled launched date of reagent: April 1, 2021

Fig.1 Illustration of CNovel™ (mesoporous carbons) and Pt-loaded CNovel™ "MH 18 PT50"

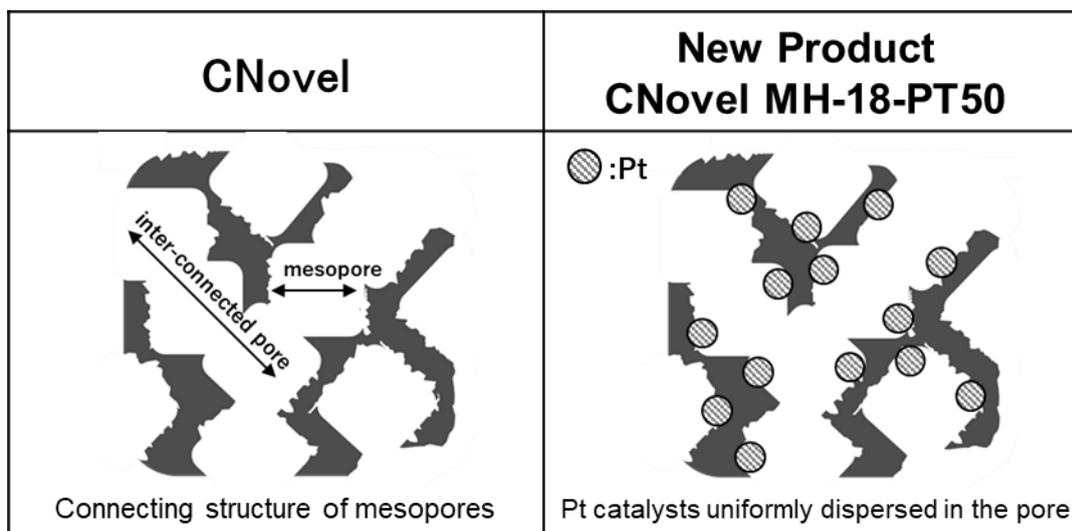


Fig.2 Photograph of transmission electron microscope(TEM) of CNovel “MH18-PT50”

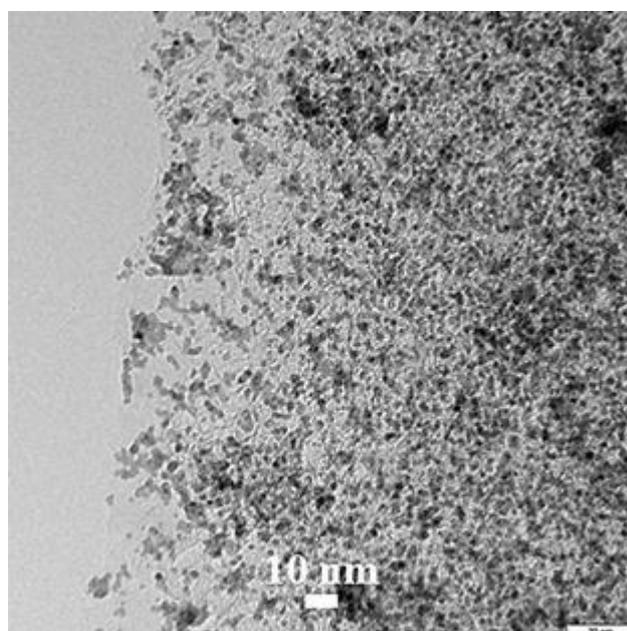


Fig. 3 Comparison of catalyst structure and performance of each support

| Carbon Supports | Porous Carbon | Solid Carbon | CNovel™ |
|--|---------------|--------------|---------|
| Structure ■ : Carbon Support ■ : Ionomer ● : Pt catalyst | | | |
| Power Output | Not Good | Good | Good |
| Durability | Acceptable | Not Good | Good |

Fig.4 Catalytic activity performance in fuel cells
(Source: N.E. CHEMCHAT)

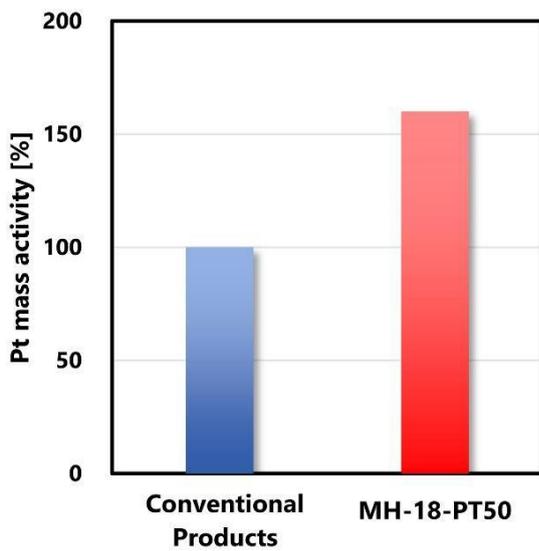
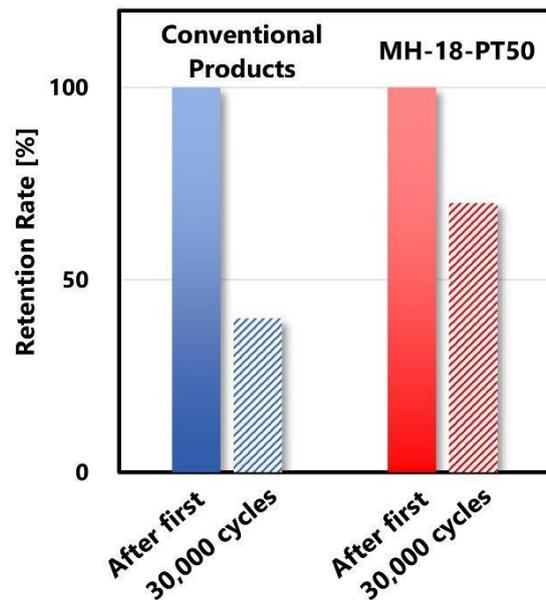


Fig.5 Comparison of catalyst performance degradation
(Source: N.E. CHEMCHAT)



※ 1 : Measurement results with Anode/Cathode = H₂/O₂, MEA Cathode

※ 2 : DOE MEA durability evaluation conditions 0.65-0.60~0.95V, 30000cycle

(June 9, 2021 Revised)

Contact :

Sales and manufacturing of CNovel™, “MH-18-PT50”

Toyo Tanso Co., Ltd

(About Products) Product inquiry form

(About Press Release) info@toyotanso.co.jp

About catalysts

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