Tohoku Univ. Technology

The Water Containing Hollow Nanoshell and its Manufactuaring Method

The water containing hollow nanoshell with oxygen nanobubble

Overview

・The water containing nanobubbles is expected to have practical effects. The combination with various reagents has also been shown to produce unique effects. In addition to washing, sterilization, and antiviral effects, attention has been focused on plant and animal cell activities. Applications in various fields such as environment, medicine, and engineering are being investigated.

・In the invention, **nanobubbles with a particle size of about 10 nm were successfully produced** by adding iron ions in the production process. The surface of the nanobubbles has an uneven structure of less than 2 nm as a nanoparticle (hollow nanoshell).

・The hollow nanoshell is dispersed in an aqueous solution at a concentration of tens of billions/mL or more. Unlike other nanoparticles and quantum dots, no stabilizer is required. Since there is almost **no cytotoxicity**, it can also be applied in **bio-medical fields for bioactive effects**.

IP Data

IP number : 2021-115507(JP)
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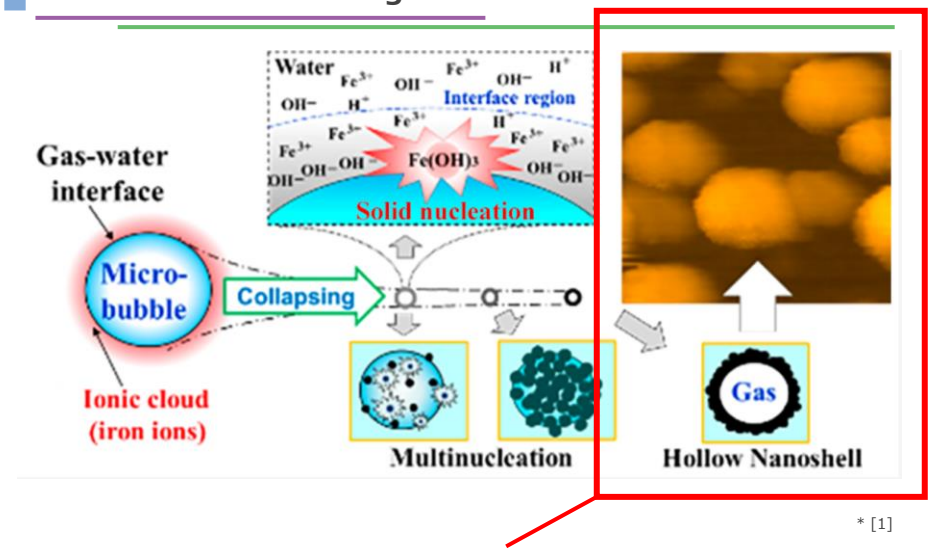
Features・Outstandings



* [1]

The nanoshells with fine uneven surface were observed by AFM.

・The water containing the hollow nanoshells was formed by adding oxygen gas and iron ions to generate nanobubble.

・The hollow nanoshells have a fine uneven surface.

⇒A novel functions are expected (e.g., strong bioactive effects) !

・**A novel method for obtaining hollow nanoshells**.

Product Application

- ☐ Water with bioactive effect and other function
- ☐ Fabrication of novel hollow nanoshells

Related Works

[1] Masayoshi Takahashi *et al.* J. Phys. Chem. Lett. 2024, 15, 220−225

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