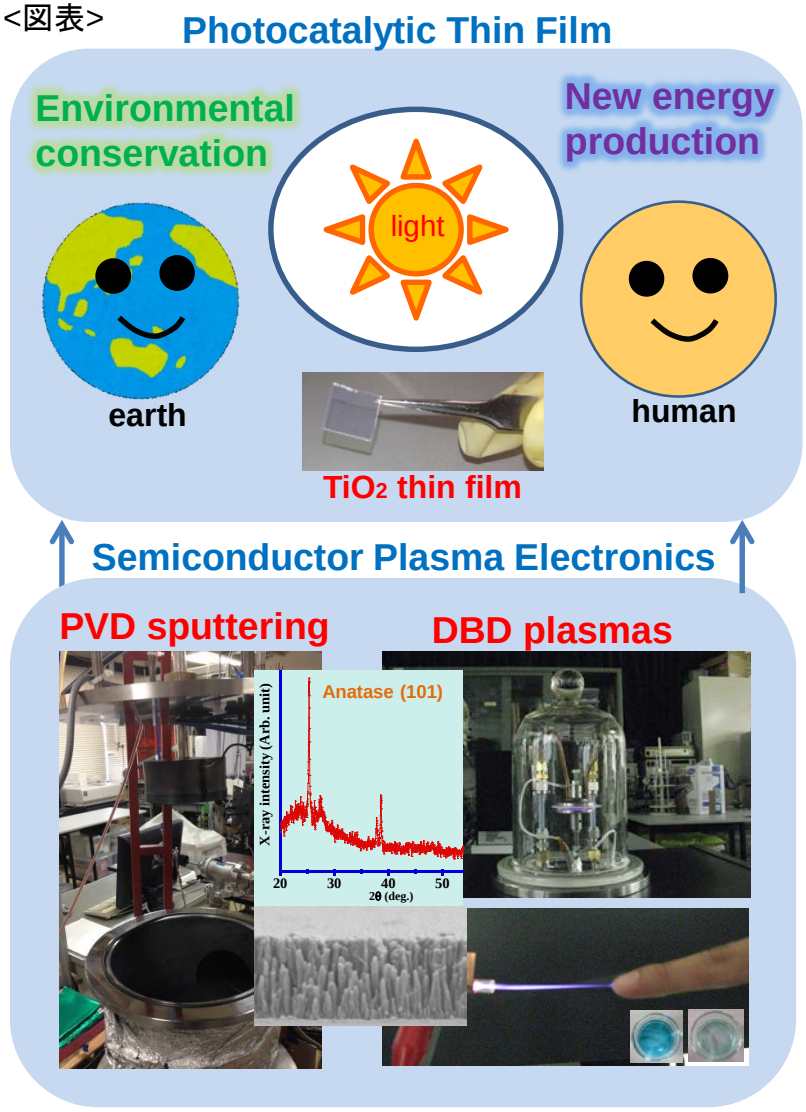
Faculty of Science and Technology
Tokushima University

Study on Photocatalytic Thin films for Environmental Conservation and New Energy Production Based on Plasma Electronics

Associate Professor Retsuo Kawakami

<図表>



Content:

Photocatalyst has been attracting much attention as a material for environmental conservation and new energy production. The advantage is that the photocatalytic activity is activated semipermanently while the surface is irradiated with light. TiO_2 is a leading candidate as the photocatalyst. This reason is that the photocatalytic activity is activated easily under irradiation with near UV-visible light and that TiO_2 is hardly dissolved by its own photocatalytic activity. Since TiO_2 is an inorganic compound, TiO_2 is harmless for human and earth, and is stable in aqueous media and reactive gas. The thin films, rather than the powders, are required from the viewpoint of the practical application such as large area coating. The photocatalytic activity induced by use of the thin films, however, is less enhanced than that induced by use of the powders.

We have been studying TiO_2 thin films with excellent photocatalytic activity by using a magnetron facing target sputtering deposition device developed by our group. The characteristic of the deposition device is that the anatase thin films is fabricated without heating the substrate and performing the post-annealing. We have also been studying the anatase films treated by using an atmospheric pressure plasma device developed by our group, in order to further enhance the original photocatalytic activity. The characteristic of the treatment device is that the surface treatment is performed easily in the absence of expensive vacuum pumps.

Keywords: Photocatalyst, Wide band-gap semiconductor, Plasma electronics

E-mail: retsuo@ee.tokushima-u.ac.jp
Tel. +81-88-656-7441
Fax: +81-88-656-7441