Faculty of Engineering
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Study on Thin film of Photocatalyst for Environmental Conservation and New Energy Production by use of Plasma Electronics

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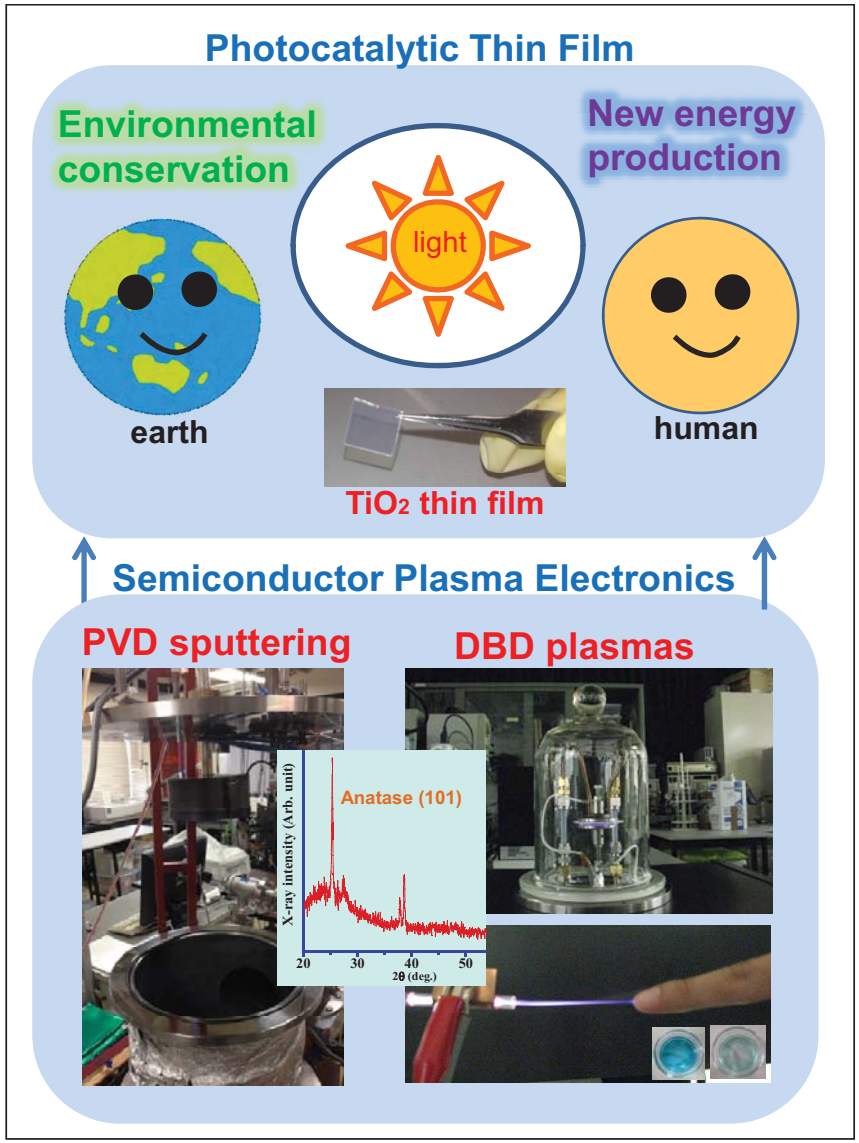

Content:

Photocatalyst has been attracting much attention as a material for environmental conservation and new energy production. It is a strong point that the photocatalytic activity is activated semipermanently while the surface is irradiated with light. TiO_2 is a leading candidate as the photocatalyst. The 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 TiO_2 is stable in aqueous media and reactive gas. The thin film, rather than the powder, is required from the viewpoint of the practical application such as large area coating. The photocatalytic activity induced by use of the thin film, however, is less enhanced than that induced by use of the powder.

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

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

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