

Fabrication of Transparent Titanium Oxide Thin Film using Organic Solution

New process to fabricate a TiO_2 thin film using an organic titanium solution is developed at AIST-Tohoku center. The coating solution can be synthesized in air within ten minutes at room temperature. Coating process is also performed in air. Dip coated or spin coated specimen, glass or metal, is dried then heated at 400 to 500°C for several minutes in air. During the heating, anatase type TiO_2 thin film of well bonded to the substrate is synthesized. This thin film is expected to use as a photocatalyst as well as a high temperature corrosion protect coating of metal.



The surface of iron pipe with(left) and without(right) titanium oxide thin film after 3 week corrosion test in water

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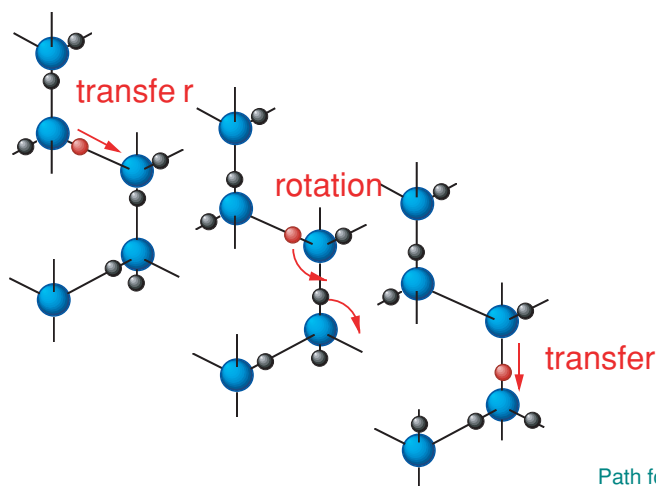
Observation of the Protonic Diffusion in Ice

- Breakthrough for the Research on Protonics -

The protonic diffusion in ice was measured for the first time using a spectroscopic technique newly developed. The diffusion coefficient at 127 °C and 10 GPa was determined to be $10^{-15} \text{m}^2/\text{s}$ larger by a factor of 10^5 than the value estimated

for ambient pressure ice. Protons can move around in ice at a rate of 30 nm per second on average. In other words, the proton jumps successively into the neighboring water molecules every 10 ms.

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Path for the protonic diffusion in ice