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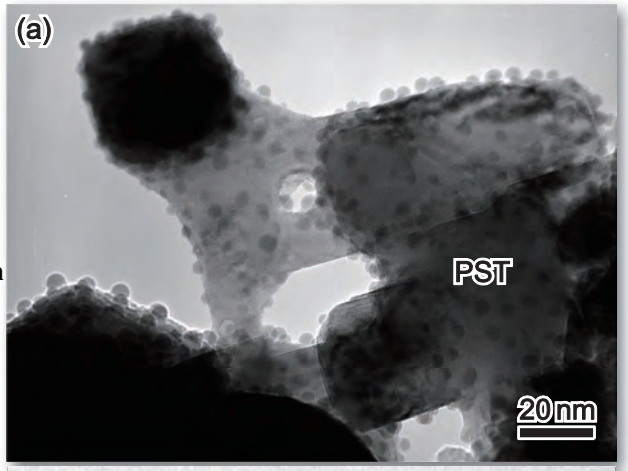
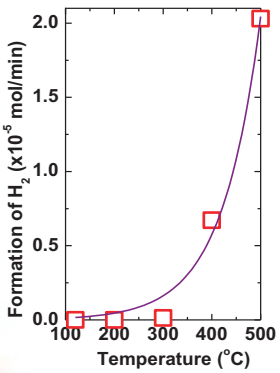
Overview

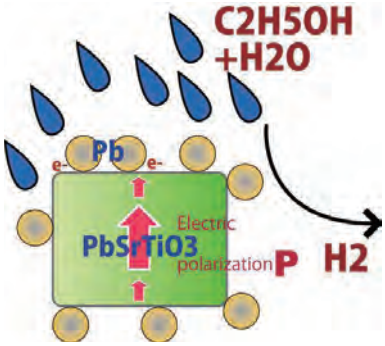
Recently, we serendipity found the novel nano-structure: base metal nanoparticles supported on the ferroelectric particles keep 4 nm size uniformly in the interface. Furthermore, our material works as a hydrogen generation catalyst from hydrocarbon material. Though we could not have clear interpretation in this novel phenomenon, it is attributed that the polarization fluctuation at the surface of ferroelectric accelerates the electron-hole pair generation at the interface between ferroelectric and base metal nanoparticles. As a result, base metals have a non-oxidized system, and dehydrogenation of hydrocarbons is promoted. When we clearly elucidate this mechanism, precious metal free fuel cell system can be realized. We just try and progress this dream.



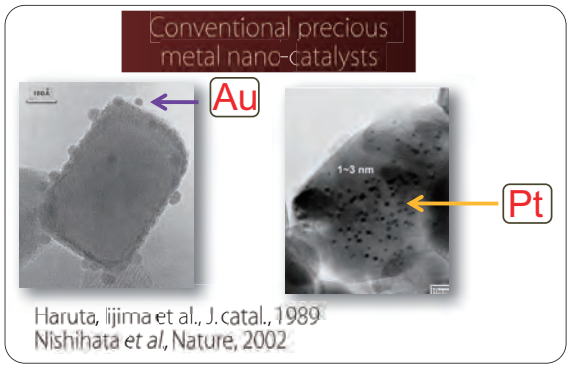
J. Kano et al., Nanotechnology, 20, 295704 (2009)

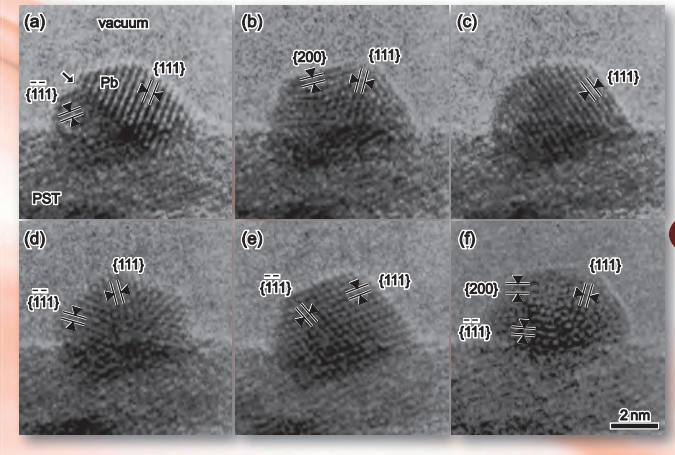
Every metal has never been oxidized on the ferroelectrics.





Tokkai 2009−207977, 2009−207978, 2009−207979





Metal nanoparticles show a structural fluctuation using by high-resolution TEM. This is a characteristic phenomenon of pure metal nanoparticles. Metal nanoparticles supported on ferroelectric can be directly identified from the spacing of the lattice fringes in the high-resolution images, and we can easily reveal the interface nano-structure.

NOW!!

Application to NOx reduction
Development of hydrogen production
Preparation of electrode for fuel cell
Clear model for ferroelectric catalysts

We can do everything without platinum.

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