

Investigation of Plasmonic Properties of Silver Nanoplates on a Substrate for Sensing and Photoelectrochemical Applications

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Metal nanostructures, such as gold and silver nanoparticles, exhibit unique optical, electric, magnetic, and catalytic properties. One of the promising properties is localized surface plasmon resonance (LSPR). When the resonant light is irradiated to the nanoparticles, collective oscillation of the electrons occurs. Accordingly, photon energy can be localized in nanospaces smaller than diffraction limit. They are expected to be useful for various applications, such as sensing and photoenergy conversion systems. Since the plasmonic properties depend on various parameters, such as sizes, shapes, metal species, refractive index of surrounding medium, and arrangement of nanoparticles, it is very important that investigation and control of their properties on a substrate for practical applications.

In this seminar, I employed silver nanoplates (AgPLs), which are plate-shaped silver nanoparticles, because they are expected to exhibit highly effective plasmonic properties.[1] I investigated their plasmonic properties on a glass substrate and developed the methods which can improve them for practical applications, such as sensing and photoelectrochemical devices.

1) Y. Takahashi, K. Suga, T. Ishida, S. Yamada, *Anal. Sci.* **2016**, *32*, 275.