

Investigation of Optimal Arrangements of Plasmonic Metal Nanoparticles for Practical Applications

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Metal nanostructures, such as gold and silver nanoparticles, exhibit unique optical, electric, magnetic, and catalytic properties that are different from bulk metals. One of the promising properties is localized surface plasmon resonance (LSPR). They are expected to be applied to various photoenergy conversion devices, such as photocatalysts and solar cells, with highly conversion efficiencies. It is known that the properties of LSPR strongly depend on various factors, such as the size, shape, orientation, and surrounding medium of a plasmonic metal nanoparticle. However, the properties were not utilized enough.

Therefore, we investigated effective arrangement of plasmonic metal nanoparticles and dyes so as to utilize photo-antenna effects based on LSPR [1-5]. These technologies should progress the field of spectroscopic analysis, as well as photoenergy conversion systems with high efficiency. In this seminar, I am here to report about the recent advances.

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