國立台灣大學材料科學工程學系

演講公告

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*****歡迎參加*****

Plasmonic NanoArchitectonics for Energy Conversion

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Combination of wide-bandgap oxides or nitrides with plasmonic nanostructures can provide us broad applications in photoelectric as well as in photothermal energy transduction. For example, by loading metal nanostructures on insulators can generate plasmonically-induced hot carriers by visible (VIS) light illumination, and in this way an ultraviolet (UV) active oxide photocatalyst can be modified into a visible (VIS) active photocatalyst [1]. Further adopting the concept of metal plamonics to low-loss conductive oxides and conductive nitrides also provides us widened opportunity for handling the light ranging from the infrared region to the visible wavelength region. We show some examples of the oxide/metal nanohybrids for the efficient photoelectric transfer and photocatalysis that combine UV active ZnO and TiO_2 and Mie plasmons of noble metals to generate VIS and near infrared (NIR) catalytic activity [2]. Also we demonstrate some examples of the photothermal energy transduction by using refractory conductive ceramics as well as metal-oxide-metal trilayers and their variants for demonstrating the wavelength selective light emission and absorption in the infrared (IR) region [3-4].

References

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