

Small Scale Interface and Surface Engineering

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Wetting on solid surfaces has been numerously studied for last few decades. Superhydrophobic surface is one of the representative superwetable surface which can water efficiently. Recently, liquid-repelling surfaces for not only water but also low surface tension liquids such as oil were developed, so called superamphiphobic and omniphobic surfaces. So far, super-liquid-repelling properties have been successfully achieved with various methods, therefore now it is time to combine superwetable surfaces on various materials for more general use. Here, I introduce a superwetable surface combined with photocatalyst, named hydrophobic metal-oxide photocatalyst. It is realized by applying a new polydimethylsiloxane (PDMS) grafting reaction to the surface of metal-oxide photocatalyst by simple illumination. Metal-oxide photocatalyst becomes hydrophobic by grafting PDMS brush, and repels most liquids due to flexible backbone of PDMS. In addition, the photocatalytic activity is remained keeping hydrophobicity stably. This combination of photocatalytic activity and hydrophobic surface opens a door for broader uses of photocatalytic activity with hydrophobic surfaces.