Improved radiation resistance of a polymer by silica coating

We demonstrate that deposition of gas barrier film is effective to suppress radiation oxidation of a polymer and can improve its radiation resistance. The gas barrier silica films were successfully formed on polypropylene by magnetron sputtering. Long-term irradiation of cobalt-60 gamma-rays in air resulted in oxidation of samples without silica coating, whereas samples with silica coating were hardly oxidized. Furthermore, the radiation resistance of polypropylene was significantly improved by silica coating. Because of non-toxicity of silica, the technique may be applicable to polymeric medical items subjected to radiation sterilization.

Superhydrophobic surface fabricated from hydrophilic materials

Super-hydrophobic surface (contact angle: 178 degrees) has been fabricated from hydrophilic material through a nano-structure control technique. Nanometer-sized pins, which align perpendicular to surface, were grown from Co aqueous solution, and the pins were coated with lauric acid, subsequently. The surface with the pins of 6.5nm diameter showed super-hidrophobicity even the pins were hydrophilic.