The Fabrication and Theory Study of Superhydrophobic Surface

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Abstract

This study is to fabricate superhydrophobic surfaces by using BA-m Polybenzoxazine and some hydrophilic polymers.

Superhydrophobic surface requires a water-repellent material and a high surface roughness. Therefore we designed a rough surface composed of BA-m Polybenzoxazine and SiO_2 nanoparticles, and then we covered it with BA-m Polybenzoxazine. The outer surface of these double coatings shows superhydrophobicity, thermal-stability and solvent-resistance. And this surface is superhydrophobic for not only pure water but also corrosive liquids, such as acidic and basic solutions.

Then we covered PS, PCL, PVPh, PVA and P4VP on the rough surfaces. Among these five polymers, PCL, PVPh, PVA and P4VP are hydrophilic polymers. To our surprise, all of them turned into superhydrophobic surfaces. According to these excellent results, they are worthy to apply to various fields.