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## **Novel fabrication of nano functionalized amorphous tungsten oxide coatings with colourful superamphiphobic surface study**

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### **Abstract**

Fabrication of surfaces with capability of repelling both water and oil is badly need. Meanwhile, the widespread use of nanomaterials has also attracted great interest in this field. In this paper, we provided a novel methods to synthesize nano amorphous tungsten oxide coatings on Al-Mg metals. After modification with FAS-17, the surface could obtain excellent superamphiphobic abilities with lower sliding angles and higher contact angles to water and oil. In addition, outstanding anti-oil pollutant and low adhesion were obtained. Furthermore, the as-prepared superamphiphobic surfaces could survive 200 cm abrasion distance under 19.6 kpa pressure on 1000 grid SiC sandpaper. It should be noted that this coatings could obtain different colors in different temperature. Meanwhile, we found that the droplets with lower surface energy and low viscosity are easier to bounce than the droplets with high surface energy and high viscosity. So the simple procedure and excellent superamphiphobicity about fabricating colourful tungsten oxide coatings have great potential in protecting Al-Mg metal and have potential applied in signals which need to prevent wetting or pollution by water and oils. On one level, this method about synthesizing nano amorphous tungsten oxide also have more promising using in other fields.

**KEYWORDS:** superamphiphobic, tungsten oxide, anti-oil pollution, low adhesion colourful surface

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