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RESEARCH NOTES

粗糙固体平面上表面的接触角滞后的简单动态水滴学说模型

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摘要: The phenomenon of hysteresis of contact angle is an important topic subject in a long time of argument.A simple hydrostatic model of sessile drops under the gravity in combination with an ideal surface roughness model is used to interpret the process of drop volume increase or decrease of a planar sessile drop and to shed light on the contact angle hysteresis and its relationship with the solid surface roughness. With this model, the advancing and receding contact angles are conceptually explained in terms of equilibrium contact angle and surface roughness only,without invoking the thermodynamic multi plicity. The model is found to be qualitatively consistent to experimental observations on contact angle hysteresis and it suggests a possible way to approach the hysteresis of three dimensional sessile drops.

关键词: 接触角滞后; 粗糙表面; 静滴; 静滴学; 气液界面张力; 表面自由能;

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Simple Hydrostatic Model of Contact Angle Hysteresis of a Sessile Drop on Rough Surface

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Abstract The phenomenon of hysteresis of contact angle is an important topic subject in a long time of argument.A simple hydrostatic model of sessile drops under the gravity in combination with an ideal surface roughness model is used to interpret the process of drop volume increase or decrease of a planar sessile drop and to shed light on the contact angle hysteresis and its relationship with the solid surface roughness. With this model, the advancing and receding contact angles are conceptually explained in terms of equilibrium contact angle and surface roughness only,without invoking the thermodynamic multi plicity. The model is found to be qualitatively consistent to experimental observations on contact angle hysteresis and it suggests a possible way to approach the hysteresis of three dimensional sessile drops.

Key words contact angle hysteresis;rough surface;hydrostatic;sessile drop;

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