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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 36086-2018

**Nanotechnology - Determination of contact angles of
nanopowders - Washburn dynamic pressure method**

纳米技术 纳米粉体接触角测量 Washburn动态压力法

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3.1 Terms and Definitions The terms and definitions defined in GB/T 24368-2009 and

Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009. This standard was proposed by the Chinese Academy of Sciences. This standard is under the jurisdiction of the National Nanotechnology Standardization Technical Committee (SAC/TC279). This standard was drafted by: East China Normal University, National Nanoscience Center. The main drafters of this standard. Ma Shiyi, Chen Banglin, Liu Xiaoxiao, Ge Guanglu, Han Qingping, Xu Jian.

Powder materials have a wide range of applications in industries such as industry, agriculture, environmental protection, and medicine. In the preparation and application of powder materials In these, it is often necessary to understand the degree of wetting of the powder by the liquid. The contact angle method for measuring the degree of wetting of liquids on flat plates has been well established. This method is directly used to characterize the degree of wetting of liquids to powders. Measurement of powder connection by Washburn dynamic pressure method The antennae can accurately reflect the degree of wetting of the powder by the liquid, and is of great significance to the development of the powder material. Nanotechnology Nano Powder Contact Angle Measurement Washburn dynamic pressure method

1 Scope

China's national method for determining the contact angle of a nanopowder by the Washburn dynamic pressure technique. Contact angle is the standard measure of whether a solid is wetted by a liquid, and on a flat surface it is measured by photographing a droplet. A powder has no flat surface to place a droplet on, so the measurement has to be made indirectly: the powder is packed into a column, one end is brought into contact with the liquid, and the liquid is drawn up through the pores by capillary action. The rate of that rise depends on the contact angle, and the Washburn relation connects the two. For nanopowders the answer matters commercially rather than academically. Whether a nanoparticle disperses in a resin, an ink, a coating or a biological medium - or clumps and settles - is decided by its surface energy, which is what this measurement reports, and

dispersion is usually the difference between a nanomaterial delivering its promised properties and behaving like an expensive filler.

This standard specifies the Washburn dynamic pressure method to measure the contact angle of nano-powder. This standard applies to the contact of liquids and nano-powders without chemical reaction, dissolution or swelling, and the measurement of the contact angle only when wetting occurs. The amount. The contact angle measurement of other powder materials can refer to this standard.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only dated versions apply to this article. For undated references, the latest version (including all amendments) applies to this document.

GB/T 24368-2009 Determination of contact angle of hydrophobic surface contamination on glass surface

GB/T 30693-2014 Measurement of contact angle of plastic film with water

3.1 Terms and Definitions The terms and definitions defined in GB/T 24368-2009 and

GB/T 30693-2014 apply to this document.

3.1.1 Wet wetting The process of replacing one liquid with another on a solid surface.

3.1.2 Contact angle contactangle After the droplets reach equilibrium on the surface of the solid, the tangent to the gas/liquid interface is made from the solid/liquid/gas three-phase boundary point. This tangent passes through the liquid and solid/ The angle between the liquid junction lines.

3.1.3 Forward angle advancingangle The maximum angle that can be observed when the droplet size increases.

3.1.4 Receding angle The smallest angle that can be observed when the droplet size is reduced.

3.1.5 Powder contact angle contactangle of powder The contact angle of the liquid on the powder particles usually refers to the advancing angle.

3.1.6 Washburn dynamic pressure method Washburn dynamic pressure method The method of calculating the contact angle of the liquid on the powder particles is measured by measuring the pressure change of the closed gas in the sample tube when the liquid penetrates.