

ICS 17.040.20

CCS G 04



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

GB/Z 26083-2010

**Determination for Copper (II) octa alkoxy-substituted
phthalocyanine on graphite surface (scanning tunneling
microscope)**

八辛氧基酞菁铜分子在石墨表面吸附结构的测试方法(扫描隧道显微镜)

(English Translation)

Issued on: January 10, 2011

Implemented on: October 1, 2011

**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine of People's Republic of China, China National Standardization
Administration**

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Foreword

The guidance of technical documents proposed by the Chinese Academy of Sciences.

The guidance of technical documents by the National Standardization Technical Committee Nano Nanomaterials Technical Committee (SAC/TC279 /SC1) centralized.

The guidance of technical documents drafting unit. Chinese Academy of Sciences Institute of Chemistry (molecular nanotechnology and nanotechnology institute key laboratory), the country

1 Scope

This guidance specifies the use of scanning tunneling microscopy of octaoctyloxy copper phthalocyanine adsorption on the graphite surface structure of the original Terms, definitions, probe and substrate preparation, sample preparation, test conditions, test procedures, image analysis, and presentation of results.

This guidance applies to the technical documents at room temperature (10 °C ~ 35 °C) and 1 atmosphere pressure conditions, with a scanning tunneling microscope test Adsorption Structure of Copper Octoctyloxy Phthalocyanine on Graphite Surface.

Note octaalkoxyphthalocyanine copper molecule (copper (II) octaalkoxyl-substitutedphthalocyanine, abbreviated as CuPcOC8, the chemical structure shown in Figure 2] Phthalocyanine is a kind of molecule, used in optoelectronics and other fields.

2 Terms and definitions

The following terms and definitions apply to this guidance document.

Tunnel effect tunnelingeffect the microscopic particle can penetrate the barrier even when the kinetic energy is lower than the barrier height, which is a quantum effect determined by the fluctuation of the microscopic particle.

Tunneling current the scanning probe and the surface being studied serve as two electrodes. When the gap between the probe and the sample reaches nanoscale, the effect of the applied electric field, The electrons pass through the current generated by the potential barrier flowing between the two electrodes toward the other electrode. Tunneling current is a measure of the overlap of electron wave functions, and the distance between tip and sample and the average work function.

Scanning Tunneling Microscope, STM Based on a microscope developed by tunneling in quantum mechanics, a sample table is obtained by probing the tunneling current between the scanning probe and the sample Topography and electronic density of states information.

Cleave cleavage

Crystal material by external mechanical force, along a certain crystal or crystal plane regularly rupture, showing its stable low index surface nature.

3 Principle

The basic principle of scanning tunneling microscope is to use the quantum tunneling effect in the work, there are constant current and constant height of two kinds of work Mode, when using constant current mode for image scanning, you can observe the sample surface relief.

4 Test conditions

Room temperature (10 °C ~ 35 °C) and 1 atmosphere pressure, scanning high orientation pyrolytic graphite (HOPG, highlyorientatedpyrolytic graphite) substrate surface to obtain the image shown in Figure 1, then prove that the instrument is working properly, you can octaoctyloxy copper phthalocyanine molecules in the stone Ink surface adsorption structure of the test.