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

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Particles - Size analysis - Colour image analysis methods

颗粒 粒度分析 彩色图像分析法

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Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009. This standard was proposed and managed by the National Technical Committee for Particle Characterization and Sorting and Screen Standardization (SAC/TC168). This standard was drafted by: Shanghai University of Technology, PetroChina Daqing Oilfield Co., Ltd. Exploration and Development Research Institute, Dandong Baite Instrument Co., Ltd., Beijing Coast Hongmeng Standard Material Technology Co., Ltd., Shenzhen Defang Nanotechnology Co., Ltd., Chinese Academy of Sciences Engineering Research Institute, China Machine Productivity Promotion Center, Beijing Physical and Chemical Analysis and Test Center, Yisiqi (Beijing) Technology Development Co., Ltd. The main drafters of this standard. Zhou Qian, Deng Wenjing, Xu Xiqing, Cai Xiaoshu, Dong Qingyun, Li Zhaojun, Su Mingxu, Li Li, Wang Yuanhang, Gao Yuan, Yu Fang and Yang Zhenghong.

The image method has become one of the main methods of particle analysis. Static and dynamic image methods generally perform threshold division based on the grayscale image of the particles. Cut to extract information such as particle size from the binary particle image. Compared with the grayscale image of particles, the color image contains richer

colors and patterns Information such as management, which is helpful for the segmentation and identification of particles, so this standard performs particle size analysis on particle color images Provide guidance on the acquisition, processing and application of color images. Particle size analysis color image analysis method

1 Scope

China's national method for particle size analysis by colour image analysis. It specifies the terms and definitions, the sample preparation, the image acquisition and the analysis. Image analysis differs from every other particle sizing technique in that it measures each particle individually rather than inferring a distribution from a bulk property. Laser diffraction gives a distribution quickly and assumes the particles are spheres; sieving gives a distribution and measures the second-smallest dimension; image analysis measures what is actually there, including shape - the aspect ratio, the circularity, the convexity - which for many materials matters as much as size. Using colour rather than greyscale adds the ability to separate particles from a background of similar brightness, and to distinguish components in a mixture by their colour, which is what allows the technique to be used on materials that are not conveniently dark on light.

This standard specifies the methods of particle color image collection, processing, and particle size analysis. This standard is applicable to the particle size of particle size analysis equipment such as image method particle size analyzer, microscope, scanner or camera. Determination.

2 Normative references

The following documents are essential for the application of this document. For dated reference documents, only the dated version applies to this article Pieces. For the cited documents without date, the latest version (including all amendments) applies to this document.

GB/T 15445.1 Expression of results of particle size analysis. Part

3 Terms and definitions

The following terms and definitions apply to this document.

3.1 Color space Three-dimensional space representing colors. Note

1. That is, each color is represented as a point in the three-dimensional coordinate system. The color space is also called a color model, and commonly used color spaces are RGB, CIELAB, HSV and HSI etc. Note

2. Rewrite GB/T 5698-2001, definition 4.57.

3.2 Hue Represents red, yellow, green, blue, purple and other color characteristics. One of the three attributes of color.

Note. The important attribute of color, which determines the nature of color, is the perception of a certain color on the surface of the object. [GB/T 5698-2001, definition 5.7]

3.3 Lightness Under the same lighting conditions, the whiteboard is used as the benchmark to give the visual perception characteristics of the object surface. One of the three attributes of color.

Note. Rewrite GB/T 5698-2001, definition 5.8.

3.4 Saturation It is used to evaluate the visual attributes of pure color components in the entire vision. [GB/T 5698-2001, definition 5.10]