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NATIONAL STANDARD OF THE PEOPLE'S REPUBLIC OF CHINA

GB/T 19421-2026

Replacing GB/T 19421-2008

Test methods for crystalline layered sodium disilicate

层状结晶二硅酸钠试验方法

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01 State Administration for Market Regulation The State Administration for Standardization issued a statement.

1.Scope This document describes the qualitative analysis of layered crystalline sodium disilicate, a detergent additive, using delta-phase X-ray diffraction, and its whiteness, pH value, and calcium content. Measurement of exchange capacity, magnesium exchange capacity, loss on ignition, wet water content, ferric oxide, sodium oxide, silicon dioxide, calcium oxide, magnesium oxide, and other indicators. Try different methods. This document applies to the determination of indicators for layered crystalline sodium disilicate products used in detergents. Qualitative Analysis of delta-phase Layered Crystalline Sodium Disilicate

---X-ray Diffraction Method

4.1 Principle Every crystalline substance possesses specific structural parameters, and under X-ray radiation of a given wavelength, it exhibits unique polymorphisms characteristic of that substance. Crystal diffraction patterns. The diffraction patterns of each phase indicate the chemical bonding state of the elements in that phase. Based on the relationship between polycrystalline diffraction patterns and crystalline materials... This unique correspondence allows for the comparison of the diffraction data of the substance to be tested with the diffraction data of various known substances, thereby enabling the determination of the phase. Sexual analysis.

4.2 Instruments and Equipment

4.2.1 X-ray diffractometer.

4.2.2 Agate mortar and pestle.

4.2.3 Sample preparation apparatus.

4.3 Procedure

4.3.1 Sample Preparation Weigh approximately 2g of the sample and grind it in a clean, dry agate mortar until the particle size is below 5μm, i.e., when rubbed between clean, dry fingers. The sample should be free of grittiness. Place the ground sample into the sample holder, fill it completely, and then gently press it down. The pressure should be enough to make the sample stand upright without collapsing after pressing.

4.3.2 Measurement Turn on the equipment cooling system and start the X-ray diffractometer, preheating for 30 minutes. Start the X-ray diffractometer control system and perform [operations/processes] on the diffractometer. Reference calibration. Under CuKalpha radiation, the sample (4.3.1) was scanned and measured in the range of 2theta from 10° to 50°.

4.3.3 Data Processing Using a data processing program, the X-ray diffraction pattern of the sample was obtained (see Appendix A), and the interplanar spacing (d) was marked on the diffraction peak positions. The obtained d-values are compared with those in Table

1.Diffraction lines that match the data in Table 1 are delta-phase layered crystalline sodium disilicate. Diffraction lines will appear; otherwise, other impurities will be present. When the content of delta-phase layered sodium disilicate in the sample is low, weaker spectral lines may not be visible. The presence of delta-phase layered crystalline sodium disilicate can be determined by the presence of three main strong lines.

4.16 Prepare and standardize a

0.1 mol/L standard titrant solution, then dilute it 10 times before use to obtain c(EDTA) =

0.01 mol/L standard titrant solution. Liquid (recalibrate if necessary).

7.2.2 Calcium chloride standard solution, c(CaCl2)=0.05mol/L; prepared and standardized according to section

4.8 of QB/T 2739-2005.

5.1 Instruments and Equipment

5.1.1 Standard Whiteboard A standard white plate conforming to GB/T 9086 is used for calibrating whiteness meters.

5.1.2 Whiteboard For ease of measurement, a smooth, unmarked, and crack-free white ceramic plate can be used as the working white plate for routine whiteness measurements. The whiteboard should be calibrated monthly using a standard whiteboard. The whiteboard should be stored in a desiccant in a dark place. If contaminated, it should be cleaned with a soft cloth or absorbent cotton. Wipe with anhydrous ethanol. Then place in a drying oven at 105°C~110°C for 30 minutes, remove, and cool to room temperature in a desiccator. Standard whiteboard calibration.

5.1.3 Whiteness meter The optical geometry of the instrument can be perpendicular/diffuse (o/d), diffuse/perpendicular (d/o), 45°/perpendicular (45°/o), and perpendicular/45° (o/ The instrument can be any of the following (45°) angles. The light source can be a D65 or C light source, and the instrument's reading accuracy must reach one decimal place. The instrument should... It meets the requirements of Level 2 or above in JJG512.

5.2 Procedure

5.2.1 Sampling The sample to be tested shall be reduced to a certain amount (not less than.200g) according to the sampling method specified in GB/T 13173 for testing.

5.2.2 Sample Preparation Select an appropriate sample quantity based on the sample density and the volume of the compactor, and compact the sample according to the steps specified in GB/T 9086 to form a smooth, non-greasy surface. Cracked and spotless sample plates were pressed in pairs for each sample.

5.2.3 Instrument Calibration Turn on, preheat, and adjust the instrument according to the instruction manual. Calibrate the instrument using a standard white board or working white board until it displays a stable nominal value.

5.2.4 Measurement of Whiteness After the instrument was calibrated and stabilized, the tristimulus values X, Y, Z, and R457 values for each sample plate were measured and recorded. For continuous measurements... During testing, the instrument should be calibrated with a standard whiteboard or working whiteboard as needed to eliminate the effects of instrument measurement drift.

5.3 Result Calculation

5.3.1 The neutral whiteness formula [Formula (1), Formula (2)] shall be used as the formula for calculating whiteness, and shall be consistent with the light tone formula [Formula (3), Formula (4)]. (4)] can be used together, and when necessary, the blue light whiteness formula [Formula (5)] can also be used for calculation.

5.3.3 If the instrument is a C-source light source, the tristimulus values Xc, Yc, and Zc measured under the C-source light source conditions are first converted according to formulas (6) to (8). Calculate the tristimulus values X, Y, and Z equivalent to the D65 light source conditions.