
Attachment: 4023 Determination of Shading Property for Colored Glass Containers

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Shading refers to the property of an object to block light transmission. Colored glass containers can provide protection for drugs that are sensitive to light. Shading property is usually expressed as spectral transmission. When light passes through the sample, spectral transmission varies with the wavelength of light, the composition, color depth, and thickness of glass.

This method applies to the determination of shading property for colored glass containers.

Determination Principle: In this method, the light beam emitted from the light source passes through the monochromator and is transformed into parallel beams of different wavelengths that vertically irradiate the sample. Calculate the ratio of the transmitted light intensity to the incident light intensity.

Instruments: UV-Vis spectrophotometer, equipped with either a photodiode detector or a photomultiplier tube coupled with an integrating sphere.

Wall thickness tester, with an accuracy of 0.01 mm.

Sample preparation: Take 5 colored glass containers and cut them into strips for testing. The sample should be suitable for fixing in the colorimetric bracket of the spectrophotometer, and the lengthwise direction of the sample should be parallel to the axis of colored glass container. The length of the sample in axial direction should be able to cover the slit.

Clean the cut samples with purified water or anhydrous ethanol, wipe their surface with lens tissue or absorbent cotton, and allow them to air dry. Avoid leaving any fingerprints or other stains on the surface. Avoid scratching the surface or cracking the sample during cutting and cleaning.

Determination: Place the sample in the UV-Vis spectrophotometer with its cylindrical axis parallel to the slit to ensure that the light beam is perpendicular to the surface of the section to reduce the loss caused by reflection. With air as the reference, measure the spectral transmission of the sample in the spectral range of 290-450 nm, at intervals of 20 nm or less.

If the shading property of the colored glass material itself is concerned, the thickness of the sample needs to be measured: select three different points in the middle of the sample, measure the thickness with a wall thickness tester, and take the average thickness of the three points as the result.

Result representation: The shading property of colored glass containers is expressed as the maximum spectral transmission (%) measured in the wavelength range. If the shading property of the colored glass material itself is concerned, it is expressed as the ratio of the maximum spectral transmission (%) measured in the wavelength range to the average thickness (mm) of the sample where the light transmitting through.

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