

4211 Determination of Moisture Adsorption Rate of Desiccants in Moisture-proof Combinational Caps

This standard applies to the determination of moisture absorption rate of desiccants in moisture-proof combinational caps with silica gel, macromolecular sieve, or a mixture of both, such as silica gel mixes macromolecular sieve (4:6), with paperboard as a barrier material.

Moisture adsorption rate The percentage of weight gained over initial desiccant sample after being placed under specified temperature and relative humidity conditions for a specified period.

Saturation moisture adsorption rate Moisture absorption rate measured after the weight gained by the desiccant sample reaches equilibrium.

Short-term moisture adsorption rate Moisture adsorption rate measured after the weight gained by the desiccant sample for a specified short period.

Environment The test shall be conducted at a temperature of $23^{\circ}\text{C}\pm 2^{\circ}\text{C}$.

Apparatus Analytical balance, precision of 0.1mg. Temperature-humidity chambers capable of controlling temperature $\pm 2^{\circ}\text{C}$ and relative humidity $\pm 5\%$.

Saturated moisture adsorption rate

Samples and methods In the environment with relative humidity not exceeding 75%, take out 5 finished caps from a sealed bag and weigh it precisely (W_0), place them in a temperature-humidity chamber at $23^{\circ}\text{C}\pm 2^{\circ}\text{C}$ and relative humidity of $75\%\pm 5\%$, weigh them precisely (W_1) at regular intervals (every 24 hours or multiples thereof) until this reach equilibrium when two successive consecutive weighings do not differ by more than 3 mg/g of substance taken. Take out the desiccant which has absorbed moisture, wipe the paperboards and caps clean and weigh them together precisely (W_2). Calculate the saturated moisture adsorption rate according to the following formula, and take arithmetic mean value of the two parallel measurements. The relative deviation of parallel measurements shall not be greater than 10%.

$$\text{Saturated moisture adsorption rate} = \frac{W_1 - W_0}{W_0 - W_2} \times 100\%$$

Short-term moisture adsorption rate

Samples and methods In the environment with relative humidity not exceeding 75%, take out 5 finished caps from a sealed bag and weigh it precisely (W_0), place them in a temperature-humidity chamber at $25^{\circ}\text{C}\pm 2^{\circ}\text{C}$ and relative humidity of $60\%\pm 5\%$ for 1 hour and then take them out to weigh precisely (W_1). Take out the desiccant which has absorbed moisture, wipe the paperboards and caps clean and weigh them together precisely (W_2). Calculate the short-term moisture adsorption rate according to the following formula, and take arithmetic mean value of the two parallel measurements. The relative deviation of parallel measurements shall not be greater than 10%.

38 Short-term moisture adsorption rate= $\frac{W_1-W_0}{W_0-W_2} \times 100\%$

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