YBB

NATIONAL STANDARD OF THE

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Determination of boron oxide

三氧化二硼测定法

Determination of boron oxide

This method is suitable for the determination of boron trioxide content in various types of medicinal glass packaging materials.

This method is to grind and dry the test sample; then melt it with alkali and decompose it with acid. Add calcium carbonate, to make the boron form water-soluble calcium borate, to separate it from other impurity elements. Add mannitol, to quantitatively convert boric acid into alcohol boric acid. Use phenolphthalein as an indicator. Use sodium hydroxide titrant for titration. Calculate the boron trioxide content, based on the volume of sodium hydroxide titrant consumed.

Determination method

Take the test sample (there shall be no printing). Clean, crush, grind it to fine powder (the particle size shall be less than 100 μm). Dry it at 105 °C ~ 110 °C for 1 hour. Put it in a desiccator, to cool for 1 hour. Take about 0.5 g of fine powder. Weigh it accurately. Put it in a platinum crucible (or silver crucible, nickel crucible). Add 4 g of anhydrous sodium carbonate (or 4 g of sodium hydroxide). Melt and let it cool. Use hot water to wash out the frit, in a 300 mL beaker. Add 20 mL of concentrated hydrochloric acid solution, to decompose the frit. Use a small amount (1→2) of hydrochloric acid, to clean the crucible. Combine the washing liquid in the beaker. After the frit is completely decomposed, use calcium carbonate to neutralize the remaining acid. Add an excess of 4 g of calcium carbonate. Place the beaker in a water bath, to boil it for about 30 minutes. Use qualitative rapid filter paper to filter it. Add a little EDTA (ethylene diamine tetraacetic acid). Boil it. Remove and cool. Add two drops of 0.1% methyl red indicator solution. Use 0.1 mol/L sodium hydroxide and 0.1 mol/L hydrochloric acid, to make the solution neutral (i.e., the solution turns bright yellow). Add 1 mL of 0.1% phenolphthalein indicator and about 2 g ~ 3 g of mannitol. Use 0.1 mol/L sodium hydroxide titration solution, to titrate it to a light red color. Repeat these steps, until the red color does not fade after adding mannitol. Calculation of results (results shall be expressed to two decimal places)

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