

4208 Determination of acetaldehyde in plastics

This method applies to the determination of acetaldehyde in polyethylene terephthalate (PET) products for pharmaceutical packaging.

The method based on gas-solid equilibrium, the sample is placed in a sealed container. At a certain temperature, the acetaldehyde diffuses into the space, and after reaching equilibrium, a quantitative headspace gas is taken and injected into the gas chromatograph for determination, characterized by retention time and quantified by peak area.

Carry out the method for gas chromatography <0512>.

Chromatographic conditions and system suitability tests The stationary phase is a capillary column of (6%) cyanopropylphenyl-(94%) dimethylsiloxane or a capillary column of similar polarity; the column temperature is 40°C, maintain for 10 min; the injection temperature is 220°C, and the flame ionization detector temperature is 250°C; the flow rate of the carrier gas is 1.5ml/min (recommended, which can be adjusted according to the selected chromatographic column).

The resolution of the peak of acetaldehyde and its neighboring peaks should be more than 1.5, and the RSD of the peak area of acetaldehyde control should not be more than 10%.

Reference solution Transfer accurately 1μl of acetaldehyde reference solution to a 20ml headspace vial (1000μg/ml), and quickly press the cap to seal. Prepare not less than 3 portions in parallel.

Test sample Take the flat part of the specimen and cut into long strips (0.5cm × 3cm. If the length of the sample is less than 3cm, cut according to the maximum length of the sample). Weigh accurately 5.0g into a 20ml headspace vial and quickly press the cap to seal. Prepare 2 portions in parallel.

Determination Equilibrate the headspace vials containing the reference solution and the test sample, each in a headspace oven at 40°C±2°C for 1 hour. Take a quantitative amount of headspace gas and inject into the gas chromatograph. Record the chromatogram.

Calculate the content of acetaldehyde in the test preparation according to the external standard method.

Note: 1. Examine the resolution of acetaldehyde from ethylene oxide if necessary.

2. After the preparation of the test sample, the experiment should be carried out immediately.