

ICS 83.080.20

CCS G 32



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 2917.1-2002

**Determination of compounds and products based on vinyl chloride
homopolymers and copolymers to evolve hydrogen chloride and any
other acidic products at elevated temperatures -- Congo red method**

(English Translation)

Issued on: May 29, 2002

Implemented on: December 1, 2002

**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine of PRC**

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1 Scope

This standard specifies the method for determining the release of hydrogen chloride and any other acidic products at high temperatures from blends and articles thereof, primarily composed of vinyl chloride homopolymers and copolymers (hereinafter referred to as PVC).

This standard applies to blends and articles thereof with PVC as the main component, but not to mixtures formed under dry blending conditions. This method can be used to characterize the thermal stability of PVC blends and products. This method is applicable to colored PVC blends and products for which the fading test during heating is unsatisfactory.

2 Normative references

The following standards contain provisions which, through reference in this standard, constitute provisions of this standard. At the time of publication of this standard, the versions shown were valid. All standards are subject to revision, and parties using this standard should explore the possibility of using the latest versions of the following standards.

GB/T 6003.1-1997 Test sieves of metal wire cloth (eqv ISO 3310-1.1990)

GB/T 6682-1992 Water for analytical laboratory use - Specification and test methods (neq ISO 3696.1987)

3 Principle

The color of a PVC blend or product sample changes from red to blue, when heated to a certain temperature in the absence of air on a Congo red test paper. If ordinary test paper is used, the suitable color change corresponds to $\text{pH} = 3$; the time required for the color change is the stabilization time t_s .

4 Materials

4.1

Congo red test paper. Approximately 10 mm wide and 30 mm long. Alternatively, it can be cut into strips approximately 10 mm wide and 30 mm long, immersed in a 150 g/L Congo red ethanol solution; then dried.

4.2

Ordinary test paper. pH range 1 ~ 10, approximately 10 mm wide and 30 mm long, graded into color increments to indicate pH changes.

5.1 Test tubes. Outer diameter. approximately 17 mm; wall thickness. approximately

0.4 mm; length. ≥ 150 mm.

5.2 Thin glass tubes. Inner diameter (2 ~ 3) mm, length approximately 100 mm (see Figure 1).

Figure 1 -- Assembly of test tubes in an oil bath

5.3 Plug. Drill a hole in the center for inserting a thin glass tube (5.2).

5.4 Oil bath. Volume not less than 10 L, temperature control accuracy 0.5°C , with an insulated cover plate, the surface of which is drilled with a hole for inserting a test tube (5.1) (see Figure 1).

5.5 Thermometer. Accuracy 0.1°C .

5.6 Stopwatch.

6 Sample preparation

The determination of the stabilization time depends to some extent on the surface area of the prepared samples and also on their heating-time curve. Any cutting or grinding of the materials required for sample preparation shall be done using a consistent method; heating shall be avoided when grinding the materials.

6.1

PVC plastisol. Spread the material on a glass plate and gel in an oven at an agreed temperature to form a sheet 0.5 mm thick. Cut the sheet into squares with sides approximately 2 mm.

6.2 PVC granules, calendered materials, injection molding materials, sheets. Cut or

grind these materials so that more than 80% of the material passes through a 2.0 mm sieve (GB/T 6003), while the majority of the material remains on a 1.4 mm sieve.

Prepare a sample using the residue from the 1.4 mm sieve.

6.3 PVC sheets. Cut the material into squares or cubes with sides less than 2 mm.

6.4 PVC coatings. Peel off the coated surface and proceed as described in 6.2 or 6.3.

6.5 Cable and conductor insulation or protective layer. Cut into thin slices of the dimensions required in 6.2.

7 Test temperature

The test temperature shall be determined according to the product specification or through negotiation between the supplier and the purchaser. The following temperatures are recommended.

- 200 °C for unplasticized blends and products.
- 200 °C for blends and products of cable insulation and protective layers.
- 180 °C for other plasticized blends and products.

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