

## D. MONOGRAPHS

### Diluted Benzoyl Peroxide

**Definition** Diluted Benzoyl Peroxide is benzoyl peroxide diluted with one or more of Aluminum Potassium Sulfate, calcium salts of phosphate, Calcium Sulfate, Calcium Carbonate, and Magnesium Carbonate which conform to the standards prescribed in JSFA , and starch.

**Content** Diluted Benzoyl Peroxide contains 19.0 - 22.0% of benzoyl peroxide ( $C_{14}H_{10}O_4=242.23$ ).

**Description** Diluted Benzoyl Peroxide occurs as a white powder.

**Identification** Place 0.2 g of Diluted Benzoyl Peroxide into a test tube, add 7 ml of chloroform, shake well, and allow to stand. A white insoluble substance remains at the bottom of the test tube. Add 2.0 ml of 4,4'-diaminodiphenylamine TS. The color of the solution and the insoluble substance change to a blue-green color.

**Purity** (1) Fineness Weigh 5 g of Diluted Benzoyl Peroxide, transfer into a dried 53- $\mu$ m standard sieve, shake vigorously in all directions for 2 minutes, occasionally tapping the bottom of the receiver, and allow to stand for 1 minute. After the fine powder has settled, weigh the residue on top of the sieve. It is not more than 1.0 g.

(2) Spread of fire Weigh 1.0 g of Diluted Benzoyl Peroxide, transfer on a glass plate so that it is 3 mm high and 10 mm wide, and light one end. The flame does not spread to the other end.

(3) Hydrochloric acid - insoluble substances Weigh 0.20 g of Diluted Benzoyl Peroxide, add 10 ml of diluted hydrochloric acid (1 4), shake well, heat gradually, and boil for about 1 minute. Cool, add about 8 ml of ether, shake well, and allow to stand. Both liquid layers are clear, and no flocculent substances exist at the interface.

(4) pH 6.0 - 9.0

**Test Solution** Weigh 3.0 g of Diluted Benzoyl Peroxide, add 30 ml of water, shake for 3 minutes filter.

(5) Ammonium salt Weigh 0.20 g of Diluted Benzoyl Peroxide, add 3 ml of sodium hydroxide solution (2 5), and boil. The evolved gas does not change the color of a red litmus paper moistened with water to blue.

(6) Heavy metals Not more than 40  $\mu$ g/g as Pb.

**Test Solution** Weigh 1.0 g of Diluted Benzoyl Peroxide, add 7 ml of diluted hydrochloric acid (1 4) and 10 ml of water, shake well, and boil gently. Cool, and add water to make 50 ml. Filter, measure 25 ml of the filtrate, adjust the pH to 4.0 - 4.5 with ammonia TS, and add 2 ml of diluted acetic acid (1 20) and water to make 50 ml.

**Control Solution** To 2.0 ml of Lead Standard Solution, add 2 ml of diluted acetic

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acid (1 : 20) and water to make 50 ml.

(7) **Barium** Weigh 2.0 g of Diluted Benzoyl Peroxide, add 15 ml of diluted nitric acid (1 : 10), shake, and filter. Wash with water, combine the filtrate and the washings, and add water to make 40 ml. Adjust the pH to 2.4 - 2.8 with ammonia TS, add water to make 50 ml, add 1 ml of diluted sulfuric acid (1 : 20), and allow to stand for 10 minutes. The solution is not turbid.

(8) **Arsenic** Not more than 4.0  $\mu\text{g/g}$  as  $\text{As}_2\text{O}_3$ .

*Test Solution* Weigh 0.50 g of Diluted Benzoyl Peroxide, add 5 ml of diluted hydrochloric acid (1 : 4), heat gently, cool quickly in ice water, and filter. Wash the residue with 15 ml of water, combine the filtrate and the washings, and add water to make 40 ml. Use 20 ml of this solution as the test solution.

*Apparatus* Apparatus B.

*Procedure* Proceed as directed in the Arsenic Limit Test, but skip the neutralization of the test solution with aqueous ammonia or ammonia TS.

**Assay** Weigh accurately about 1 g of Diluted Benzoyl Peroxide, transfer into a flask with a ground-glass stopper, add 50 ml of a chloroform - methanol mixture (1 : 1), and shake. Add 0.5 ml of a solution of citric acid in methanol (1 : 10) and 2 ml of potassium iodide solution (1 : 2), immediately stopper tightly, allow to stand in a dark place for 15 minutes while shaking occasionally. Titrate the liberated iodine with 0.1 mol/l sodium thiosulfate (indicator: starch TS). Perform a blank test in the same manner, and make any necessary correction.

1 ml of 0.1 mol/l sodium thiosulfate = 12.112 mg of  $\text{C}_{14}\text{H}_{10}\text{O}_4$