Ethylene-4-Methylpentene-1 Copolymer

Definition

Ethylene-4-Methylpentene-1 Copolymer is an ethylene-4-methylpentene-1 copolymer resin obtained by copolymerizing ethylene and 4-methylpentene-1.

Description

It occurs as translucent powder or granules, and is practically odorless.

Identification

Determine the infrared absorption spectrum of this substance as directed in the film method under Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about 2960 cm^{-1}, 2870 cm^{-1}, 1460 cm^{-1}, 1384 cm^{-1}, 1366 cm^{-1}, 1169 cm^{-1}, 920 cm^{-1}, 730 cm^{-1} and 720 cm^{-1}.

Specific gravity: 0.85-0.94

Melting point: 120-130°C

Purity

(1) Clarity and color of solution

Dissolve 1 g of this substance in 50 mL of xylene by heating: the solution is colorless and clear.

(2) Heavy metals: Not more than 20 ppm (Method 2)

(3) Arsenic: Not more than 2 ppm (Method 2)

Residue on ignition: Not more than 0.1% (5.0 g, Method 1)

Chemical Pulp

Definition

Chemical Pulp is obtained by the chemical treatment of fiber to separate the fibers.

Description

It is white in color, practically odorless, and contains no foreign matter.

Purity

(1) Lignin

Dissolve 0.1 g of phloroglucin in 15 mL of hydrochloric acid, add water to make 20 mL and drop onto this substance: no marked pink or red color develops.

(2) Coloring matter

Immerse 10 g of this substance in 100 mL of freshly boiled and cooled water, stir and filter. Transfer 50 mL of the filtrate into a Nessler tube and observe downward: the filtrate is almost colorless.

(3) Acidity or alkalinity

Transfer 10 mL of the filtrate (2) into a test tube 15 mm in inside diameter and add 2 drops of phenolphthalein TS: no red color develops. Separately, to 10 mL of the same solution, add 1 drop of methyl orange TS: no red color develops.

(4) Fluorescence

Irrdiate this substance with ultraviolet rays (main wavelength: 365 nm) in a dark place: it shows neither

marked fluorescence nor fluorescence by contamination.

Total ash: Not more than 0.65% (5.0 g)

Active Carbon

Definition

Active Carbon is obtained by activating carbon substance such as plant-based fibers treated with oxidizing gas or chemicals at high temperature.

Description

It occurs as black powder, granules or fibrous substances, and it is odorless.

Identification

(1) If this substance is a powder, use it as it is. If it is in a granular or fibrous state, pulverize well to powder. Take about 0.1 g of this substance in a powder state, add 10 mL of dilute methylene blue TS and 2 drops of hydrochloric acid (1 in 4), shake well and filter with a dry filter paper for quantitative analysis (5C): the filtrate is colorless.

(2) Take about 0.5 g of this substance in a powder state in a test tube and heat over a direct flame while supplying air: it burns without any flame. Pass the evolved gas through calcium hydroxide TS: a white turbidity is produced.

Purity

(1) Color and acidity or alkalinity of solution
To 3.0 g of this substance, add 60 mL of water, boil for 5 minutes, cool, add water to make 60 mL and filter: the filtrate is colorless and neutral.

(2) Heavy metals: Not more than 50 ppm (0.50 g, Method 2, Standard Lead Solution 2.5 mL)

(3) Arsenic: Not more than 2 ppm (Method 2)

Flocculent Sodium Carboxymethylcellulose

Definition

Flocculent Sodium Carboxymethylcellulose is flocculent fiber made from the sodium salt of carboxymethylether of parts of fiber structure of plant-based fibers.

Description

(1) It is white in color, odorless, and contains no foreign matter.

(2) It does not remarkably contain broken pieces of pericarp and seed, or nep.

Identification

It becomes slightly viscous when water is added.

Purity

(1) Coloring matter
Immerse 10 g of this substance in 100 mL of ethanol, press out, transfer 50 mL of the extract into a Nessler tube and observe downward: a yellow color may develop but neither blue nor green color develops.

(2) Acidity or alkalinity

To 10 g of this substance, add 100 mL of freshly boiled and cooled water and allow to cool. To 25 mL of the solution, add 3 drops of phenolphthalein TS: no red color develops. Separately, to 25 mL of the same solution, add 1 drop of methyl orange TS: no red color develops.

(3) Fluorescence

Irrdiate this substance with ultraviolet rays (main wavelength: 365 nm) in a dark place: it shows neither marked fluorescence nor fluorescence by contamination.

(4) Sedimentation velocity

Prepare a test basket, weighing about 3 g from copper wire 0.4 mm in diameter (No. 26) in the form of a cylinder 50 mm in diameter and 80 mm in depth, with 20-mm intervals between the wires. Place 5.0 g of this substance in the test basket, drop the basket on its side gently into the water about 200 mm in depth at ordinary temperature from the height of about 10 mm above the water surface: the basket sinks in water within 8 seconds.

Total ash: Not more than 5.6% (5.0 g)

Absorbent Paper

Definition

Absorbent Paper is a paper made of chemical pulp.

Description

(1) It is white in color, odorless, and contains no foreign matter.

(2) It does not remarkably contain undissociated fibers.

Purity

(1) Lignin

Dissolve 0.1 g of phloroglucin in 15 mL of hydrochloric acid, add water to make 20 mL and drop onto this substance: no marked pink or red color develops.

(2) Coloring matter

Immerse 10 g of this substance in 100 mL of ethanol, press out, transfer 50 mL of the extract into a Nessler tube and observe downward: a yellow color may develop but neither blue nor green color develops.

(3) Acidity or alkalinity

To 10 g of this substance, add 100 mL of freshly boiled and cooled water and allow to cool. To 25 mL of the solution, add 3 drops of phenolphthalein TS: no red color develops. Separately, to 25 mL of the same solution, add 1 drop of methyl orange TS: no red color develops.

(4) Fluorescence

Irrdiate this substance with ultraviolet rays (main wavelength: 365 nm) in a dark place: it shows neither marked fluorescence nor fluorescence by contamination.

(5) Sedimentation velocity

Prepare a test basket, weighing about 3 g from copper wire 0.4 mm in diameter (No. 26) in the form of a cylinder 50 mm in diameter and 80 mm in depth, with 20-mm intervals between the wires. Place 5.0 g of

this substance in the test basket, drop the basket on its side gently into the water about 200 mm in depth at ordinary temperature from the height of about 10 mm above the water surface: the basket sinks in water within 8 seconds.

Total ash: Not more than 0.65% (5.0 g)

High-density Polyethylene (HDPE)

Definition

High-density Polyethylene (HDPE) is a straight-chain high-density polyethylene resin obtained by the polymerization of ethylene.

Description

It occurs as translucent powder or granules, and it is practically odorless.

Identification

Determine the infrared absorption spectrum of this substance as directed in the film method under Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about 2960 cm^{-1}, 2870 cm^{-1}, 1460 cm^{-1}, 730 cm^{-1} and 720 cm^{-1}.

Specific gravity: 0.85-1.00

Melting point: 115-140°C

Purity

(1) Clarity and color of solution

Dissolve 1 g of this substance in 50 mL of xylene by heating: the solution is colorless and clear.

(2) Heavy metals: Not more than 20 ppm (Method 2)

(3) Arsenic: Not more than 2 ppm (Method 2)

Residue on ignition: Not more than 0.1% (5.0 g, Method 1)

Cycloaliphatic Saturated Hydrocarbon Resin

Definition

Cycloaliphatic Saturated Hydrocarbon Resin is a hydrogenated C_9-group petroleum resin. The mean molecular weight is 550 to 900.

Description

It occurs as an almost colorless clear glass mass, and it is odorless or has a faint, characteristic odor.

Specific gravity: 0.98-1.03

Identification

Dissolve about 1.0 g of this substance in 5 mL of chloroform and determine the infrared absorption spectrum of this substance as directed in the film method under Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about 2930 cm^{-1}, 1450 cm^{-1}, 1380 cm^{-1} and 760 cm^{-1}.

Heavy metals: Not more than 10 ppm (Method 2)

Loss on drying: Not more than 1.0% (2.0 g, 105°C, 2 hours)

Residue on ignition: Not more than 0.01% (50 g, 800°C, 3 hours)

Cycloparaffin

Definition

Cycloparaffin is a mixture of liquid hydrocarbons obtained from petroleum.

Description

It is a colorless to light yellow liquid, and it is odorless or has a faint, characteristic odor.

Specific gravity: d_4^{15} 0.81-0.94

Purity

(1) Acidity or alkalinity

To 10 mL of this substance, add 10 mL of hot water and 1 drop of phenolphthalein TS, and shake vigorously: no red color develops. Separately, to 10 mL of this substance, add 10 mL of hot water and 1 drop of methyl orange TS: no red color develops.

(2) Sulfur compounds

To 4 mL of this substance, add 2 mL of ethanol (99.5) and 2 drops of a transparent sodium hydroxide solution (1 in 5) saturated with lead monoxide, heat at 70°C for 10 minutes with occasional shaking, and allow to cool: no dark brown color develops.

(3) Polynuclear aromatic hydrocarbons

Transfer 25 mL of this substance into a 100-mL separator using a 25-mL measuring cylinder, wash the measuring cylinder with 25 mL of n-hexane for ultraviolet-visible spectrophotometry, combine the washings with the liquid in the separator, and shake well. Shake this solution vigorously with 5.0 mL of dimethylsulfoxide for ultraviolet-visible spectrophotometry for 2 minutes, and allow to stand for 15 minutes. Transfer the lower layer into a 50-mL separator, add 2 mL of n-hexane for ultraviolet-visible spectrophotometry, shake vigorously for 2 minutes and allow to stand for 2 minutes. Transfer the lower layer into a glass-stoppered 10-mL centrifuge tube, centrifuge at the rate between 2500 and 3000 rpm for about 10 minutes. Transfer the clear solution so obtained into a cell, stopper tightly, and use this solution as the sample solution. Separately, transfer 25 mL of n-hexane for ultraviolet-visible spectrophotometry into another 50-mL separator, shake vigorously with 5.0 mL of dimethylsulfoxide for ultraviolet-visible spectrophotometry for 2 minutes, and allow to stand for 2 minutes. Transfer the lower layer into a glass-stoppered 10-mL centrifuge tube, centrifuge at the rate between 2500 and 3000 rpm for about 10 minutes. Transfer the clear solution so obtained into a cell, and stopper tightly. Immediately determine the absorbance of the sample solution using this solution as the blank: it is not more than 4.0 at the wavelength between 260 and 350 nm.

(4) Heavy metals: Not more than 10 ppm (2.0 g, Method 3, Standard Lead Solution 2.0 mL)

(5) Arsenic: Not more than 2 ppm (Method 2)

Dibenzothiazyl Disulfide

Definition

Dibenzothiazyl Disulfide is di(benzothiazolyl-2)disulfide ($C_{14}H_8N_2S_4$ 332.49) obtained by the reaction of an

aqueous solution of the alkali salt of 2-mercaptobenzenthiazole with oxidants such as bromine.

Description

It occurs as a white to light yellow powder, and it is not soluble in water and ethanol, but soluble in toluene and chloroform.

Identification

Take 0.1 g of this substance in a volumetric flask and dissolve in chloroform to make 100 mL. Perform the test with 5 μL of this solution as directed under Liquid Chromatography: a peak is observed at the retention time of about 22.6 minutes.

Operating conditions

Detector: An ultraviolet absorption photometer (wavelength: 254 nm)

Column: A stainless steel column, 4.6 mm in inside diameter and 25 cm in length, packed with octadecylsilanized silica gel

Flow rate: 0.8 mL/min

Melting point: 165-175°C

Purity

(1) Heavy metals: Not more than 20 ppm (Method 2)

(2) Arsenic: Not more than 2 ppm (Method 2)

Residue on ignition: Not more than 0.5% (Method 1)

Aliphatic Hydrocarbon Resin

Definition

Aliphatic Hydrocarbon Resin is a C_5-group petroleum hydrocarbon resin. The mean molecular weight is 500 to 2000.

Description

(1) It occurs as a white to light yellowish brown easily-breakable solid, and it is odorless or has a faint, characteristic odor.

(2) It is freely soluble in toluene, and practically insoluble in water and ethanol.

Specific gravity: 1.03-1.06

Identification

Mix this substance, previously pulverized, with potassium bromide powder, solidify to plate-like shape, and determine the infrared absorption spectrum of this substance as directed in the potassium bromide disk method under Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about between 2970 cm^{-1} and 2950 cm^{-1} and 1300 cm^{-1}.

Heavy metals: Not more than 10 ppm (Method 2)

Loss on drying: Not more than 1.0% (2.0 g, 105°C, 2 hours)

Residue on ignition: Not more than 0.01% (1.0 g, 450-550°C)

Aliphatic and Aromatic Copolymer Resin

(Aromatic and Denatured Aliphatic Hydrocarbon Resin)

Definition

Aliphatic and Aromatic Copolymer Resin (Aromatic and Denatured Aliphatic Hydrocarbon Resin) is obtained by the copolymerization of a C_5-group resin and an aromatic resin. The mean molecular weight is 400 to 1500.

Description

(1) It occurs as a light yellow solid or viscous liquid, and it is practically odorless.

(2) It is practically insoluble in water and ethanol, but freely soluble in tetrahydrofuran and diethyl ether.

Identification

Dissolve 1 g of this substance in 10 mL of toluene, apply onto a potassium bromide disk, evaporate the toluene to obtain a film and determine the infrared absorption spectrum of this substance as directed in the film method under Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about between 2970 cm^{-1} and 2950 cm^{-1}, 1600 cm^{-1}, 1460 cm^{-1}, 1370 cm^{-1} and 700 cm^{-1}.

Purity

(1) Clarity of solution

Dissolve 150 g of this substance in 400 mL of tetrahydrofuran: the solution is clear.

(2) Heavy metals: Not more than 10 ppm (Method 2)

Loss on drying: Not more than 3% (5.0 g, 105°C, 4 hours)

Residue on ignition: Not more than 0.01% (30 g, 600°C)

Aliphatic Saturated Hydrocarbon Resin

Definition

Aliphatic Saturated Hydrocarbon Resin is a hydrogenated C_5-group petroleum resin. The mean molecular weight is 300 to 600.

Description

It is an almost colorless clear viscous liquid, and it is odorless or has a faint, characteristic odor.

Specific gravity: d_4^{15} 0.90-0.95

Identification

Dissolve about 1 g of this substance in 5 mL of chloroform and determine the infrared absorption spectrum of this substance as directed in the film method under Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about 2930 cm^{-1}, 1450 cm^{-1}, 1380 cm^{-1} and 760 cm^{-1}.

Heavy metals: Not more than 10 ppm (Method 2)

Loss on drying: Not more than 1.0% (2.0 g, 105°C, 2 hours)

Residue on ignition: Not more than 0.1% (50 g, 800°C, 3 hours)

Hydrogenated Aliphatic and Aromatic Copolymer Resin

Definition

Hydrogenated Aliphatic and Aromatic Copolymer Resin is obtained by the copolymerization and hydrogenation of a C_5-group resin and an aromatic resin. The mean molecular weight is 500 to 1000.

Description

It occurs as a colorless clear pellet or flake solid, and it is odorless or has a faint, characteristic odor.

It is freely soluble in toluene, xylene and diethyl ether, but practically insoluble in water and ethanol.

Identification

Mix completely 1 mg of this substance and 100 to 200 mg of dried potassium bromide for infrared spectrophotometry, and determine the infrared absorption spectrum of this substance as directed in the potassium bromide disk method under Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about 3650 cm^{-1}, 2930 cm^{-1}, 2850 cm^{-1}, 2790 cm^{-1}, 2670 cm^{-1}, 2600 cm^{-1}, 1746 cm^{-1}, 1449 cm^{-1}, 1375 cm^{-1}, 890 cm^{-1}, 843 cm^{-1}, 757 cm^{-1} and 700 cm^{-1}.

Heavy metals: Not more than 10 ppm (Method 2)

Loss on drying: Not more than 1.0% (2.0 g, 105°C, 2 hours)

Residue on ignition: Not more than 0.02% (5.0 g, 850°C, 30 minutes)

Hydrogenated Dicyclopentadiene-group Hydrocarbon Resin

Definition

Hydrogenated Dicyclopentadiene-group Hydrocarbon Resin is a solid resin obtained by the hydrogenation of a dicyclopentadiene-based polymer. The mean molecular weight is 300 to 700.

Description

It occurs as a colorless, clear, easily-breakable solid, and it is odorless.

It is freely soluble in tetrahydrofuran and toluene, but practically insoluble in water and ethanol.

Acid value: Not more than 0.1 (Method 1)

Weigh accurately 2 g of this substance and dissolve it in a 40-mL mixture of toluene and isopropyl alcohol (2:1), and perform the test with this solution.

Specific gravity: 1.05-1.08

Identification

Mix this substance, previously pulverized, with potassium bromide powder, solidify to plate-like shape, and determine the infrared absorption spectrum of this substance as directed in the potassium bromide disk method under Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about between 2970 cm^{-1} and 2950 cm^{-1}, 1463 cm^{-1} and 1373 cm^{-1}.

Purity

(1) Clarity of solution

Dissolve 150 g of this substance in 400 mL of tetrahydrofuran: the solution is clear.

(2) Heavy metals: Not more than 10 ppm (Method 2)

Loss on drying: Not more than 1% (5.0 g, 105°C, 4 hours)

Residue on ignition: Not more than 0.01% (30 g, 600°C)

Styrene-Isoprene-Styrene Block Copolymer

Definition

Styrene-Isoprene-Styrene Block Copolymer is a ternary block copolymer of polystyrene, polyisoprene and polystyrene. The mean molecular weight is 80000 to 200000.

Description

It occurs as a white to light yellow elastic pellet, crumb or powder solid, and it is odorless or has a faint, characteristic odor.

It is freely soluble in tetrahydrofuran, diethyl ether, and toluene, but practically insoluble in water and ethanol.

Identification

Dissolve 1 g of this substance in 10 mL of toluene, apply 1 drop of this solution onto a potassium bromide disk, evaporate the solvent to obtain a film and determine the infrared absorption spectrum of this substance as directed in the film method under Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about 2960 cm^{-1}, 2850 cm^{-1}, 1600 cm^{-1}, 1452 cm^{-1}, 1375 cm^{-1}, and 837 cm^{-1}.

Viscosity

Dissolve 50.0 g of this substance in 150 g of toluene, use the solution as the sample solution, and measure viscosity twice: the mean viscosity is 100 - 1700 mPa·s. (Brookfield type viscometer, No. 3, 10-60 rotations, 30±1°C, 1 minute)

Purity

(1) Clarity and color of solution

Dissolve 1.0 g of this substance in 100 mL of toluene: the solution is colorless and clear.

(2) Extractable substances

To 5.0 g of this substance, add 80 mL of water, and boil under a reflux condenser for 30 minutes. After cooling, filter the extract, and add water to the filtrate to make exactly 100 mL. Use this solution as the sample solution for the following tests.

1) pH: 6.0-9.0

2) Chloride

Perform the test with 10 mL of the sample solution as directed under Chloride Limit Test: not more than 0.085%. Prepare the control solution with 1.2 mL of 0.01 mol/L hydrochloric acid

3) Heavy metals: Not more than 20 ppm (20 mL of the sample solution, Method 1, Standard Lead Solution 2 mL)

4) Potassium permanganate-reducing substances

Transfer 25 mL of the sample solution into a glass-stoppered, Erlenmyer flask, add 10.0 mL of 0.002 mol/L potassium permanganate VS and 5 mL of dilute sulfuric acid, and boil for 3 minutes. After cooling, add 0.10 g of potassium iodide, stopper tightly, shake, and allow to stand for 10 minutes. Titrate the solution with 0.01 mol/L sodium thiosulfate VS (indicator: 5 drops of starch TS). Perform the test in the same manner, using 25 mL of the blank solution, and obtain the difference of the consumption of 0.002 mol/L potassium permanganate VS between these solutions: not more than 2.0 mL.

(3) Styrene

Weigh exactly 5.0 g of this substance, and dissolve in 50 mL of tetrahydrofuran. Add methanol to make

exactly 100 mL, shake vigorously for 10 minutes, centrifuge and use the supernatant liquid as the sample solution. Separately, weigh exactly 0.10 g of styrene, and add methanol to make exactly 100 mL. Measure exactly 5 mL of the solution, and add methanol to make exactly 100 mL. Measure exactly 1 mL of the solution, add 50 mL of tetrahydrofuran, mix well, add methanol to make exactly 100 mL, and use this solution as the standard solution. Perform the test with 100 μL each of the sample solution and standard solution as directed under Liquid Chromatography according to the following conditions. Determine each peak area from these solutions by the automatic integration method: the peak area of styrene from the sample solution is not larger than the peak area of styrene from the standard solution.

Operating conditions

Detector: An ultraviolet absorption photometer (wavelength: 268 nm)

Column: A stainless steel column, about 4 mm in inside diameter and about 15 cm in length, packed with 10-μm octadecylsilanized silica gel for liquid chromatography

Column temperature: A constant temperature of about 25°C

Mobile phase: A mixture of water and tetrahydrofuran (1:1)

Flow rate: Adjust the flow rate so that the retention time of styrene is about 5 minutes.

Detection sensitivity: Adjust it so that the peak height of styrene obtained from 100 μL of the standard solution is not less than 5 mm.

(4) Lithium

Take 1.0 g of this substance in a crucible, and ignite at 450°C to 500°C to incinerate. After cooling, dissolve the residue in 2 mL of 0.1 mol/L hydrochloric acid TS, add 10 mL of water, and filter though a glass filter (G4). To this filtrate, add water to make exactly 200 mL, and use this solution as the sample solution. Separately, measure exactly 1.0 mL of Standard Lithium Solution for Atomic Absorption Spectrophotometry, and add water to make exactly 100 mL. Measure exactly 10 mL of this solution, add 2 mL of 0.1 mol/L hydrochloric acid TS, add water to make exactly 100 mL, and use this solution as the standard solution. Perform the test with the sample solution and the standard solution as directed under Atomic Absorption Spectrophotometry according to the following conditions: the absorbance of the sample solution is not more than that of the standard solution.

Gas: Combustible gas-Acetylene

Supporting gas-Air

Lamp: Lithium hollow-cathode lamp

Wavelength: 670.8nm

Loss on drying: Not more than 1.0% (0.1 g, 105°C, 4 hours)

Residue on ignition: Not more than 2.0% (1 g)

Styrene-Ethylene-Butylene-Styrene Block Copolymer

Definition

Styrene-Ethylene-Butylene-Styrene Block Copolymer is a block copolymer of polystyrene-polyethylene butylene-polystyrene, obtained by the hydrogenation of a copolymer consisting of a

polystyrene-polybutadiene-polystyrene block. The mean molecular weight is 30000 to 300000.

Description

It occurs as a white to light yellow elastic pellet, crumb or powder solid, and it is odorless or has a faint, characteristic odor.

It is freely soluble in tetrahydrofuran, diethyl ether, and toluene, but practically insoluble in water and ethanol.

Identification

Dissolve 1 g of this substance in 10 mL of toluene, apply 1 drop of this solution onto a potassium bromide disk, evaporate the solvent to obtain a film and determine the infrared absorption spectrum of this substance as directed in the film method under Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about 2920 cm^{-1}, 2850 cm^{-1}, 1601 cm^{-1}, 1380 cm^{-1}, 760 cm^{-1} and 700 cm^{-1}.

Viscosity

Dissolve 50.0 g of this substance in 150 g of toluene, remove air bubbles, use the solution as the sample solution, and measure viscosity twice: the mean viscosity is 100 - 10000 mPa·s. (Brookfield type viscometer, No. 3, 10-60 rotations, 25±1°C, 1 minute)

Purity

(1) Clarity and color of solution

Dissolve 1.0 g of this substance in 100 mL of toluene: the solution is colorless and clear.

(2) Extractable substances

To 5.0 g of this substance, add 80 mL of water, and boil under a reflux condenser for 30 minutes. After cooling, filter the extract, and add water to the filtrate to make exactly 100 mL. Use this solution as the sample solution for the following tests.

1) pH: 5.0-9.0

2) Chloride

Perform the test with 10 mL of the sample solution as directed under Chloride Limit Test: not more than 0.085%. Prepare the control solution with 1.2 mL of 0.01 mol/L hydrochloric acid

3) Heavy metals: Not more than 20 ppm (20 mL of the sample solution, Method 1, Standard Lead Solution 2 mL)

4) Potassium permanganate-reducing substances

Trnasfer 25 mL of the sample solution into a glass-stoppered, Erlenmyer flask, add 10.0 mL of 0.002 mol/L potassium permanganate VS and 5 mL of dilute sulfuric acid, and boil for 3 minutes. After cooling, add 0.10 g of potassium iodide, stopper tightly, shake and allow to stand for 10 minutes. Titrate the solution with 0.01 mol/L sodium thiosulfate VS (indicator: 5 drops of starch TS). Perform the test in the same manner, using 25 mL of the blank solution, and obtain the difference of the consumption of 0.002 mol/L potassium permanganate VS between these solutions: not more than 2.0 mL.

(3) Styrene

Weigh exactly 5.0 g of this substance, and dissolve in 50 mL of tetrahydrofuran. Add methanol to make exactly 100 mL, shake vigorously for 10 minutes, centrifuge and use the supernatant liquid as the sample

solution. Separately, weigh exactly 0.10 g of styrene, and add methanol to make exactly 100 mL. Measure exactly 5 mL of the solution, and add methanol to make exactly 100 mL. Measure exactly 1 mL of the solution, add 50 mL of tetrahydrofuran, mix well, add methanol to make exactly 100 mL, and use this solution as the standard solution. Perform the test with 100 μL each of the sample solution and standard solution as directed under Liquid Chromatography according to the following conditions. Determine each peak area from these solutions by the automatic integration method: the peak area of styrene from the sample solution is not larger than the peak area of styrene from the standard solution.

Operating conditions

Detector: An ultraviolet absorption photometer (wavelength: 268 nm)

Column: A stainless steel column, about 4 mm in inside diameter and about 15 cm in length, packed with 10-μm octadecylsilanized silica gel for liquid chromatography

Column temperature: A constant temperature of about 25°C

Mobile phase: A mixture of water and tetrahydrofuran (1:1)

Flow rate: Adjust the flow rate so that the retention time of styrene is about 5 minutes.

Detection sensitivity: Adjust it so that the peak height of styrene obtained from 100 μL of the standard solution is not less than 5 mm.

(4) Lithium

Take 1.0 g of this substance in a crucible, and ignite at 450°C to 500°C to incinerate. After cooling, dissolve it in 2 mL of 0.1 mol/L hydrochloric acid TS, add 10 mL of water, and filter though a glass filter (G4). To this filtrate add water to make exactly 200 mL, and use this solution as the sample solution. Separately, measure exactly 1.0 mL of Standard Lithium Solution for Atomic Absorption Spectrophotometry, and add water to make exactly 100 mL. Meaure exactly 10 mL of this solution, add 2 mL of 0.1 mol/L hydrochloric acid TS, add water to make exactly 100 mL, and use this solution as the standard solution. Perform the test with the sample solution and the standard solution as directed under Atomic Absorption Spectrophotometry according to the following conditions: the absorbance of the sample solution is not more than that of the standard solution.

Gas: Combustible gas-Acetylene

Supporting gas-Air

Lamp: Lithium hollow-cathode lamp

Wavelength: 670.8nm

Loss on drying: Not more than 1.0% (1.0 g, 105°C, 4 hours)

Residue on ignition: Not more than 2.0% (Method 1)

Styrene-Ethylene-Propylene-Styrene Block Copolymer

Definition

Styrene-Ethylene-Propylene-Styrene Block Copolymer is a block copolymer of polystyrene-polyethylene propylene-polystyrene, obtained by the hydrogenation of a copolymer consisting of a polystyrene-polyisoprene-polystyrene block or styrene-poly(isoprene/butadiene)-polystyrene. The mean

molecular weight is 30000 to 300000.

Description

It occurs as a white to light yellow elastic pellet, crumb or powder solid, and it is odorless or has a faint, characteristic odor.

It is freely soluble in tetrahydrofuran, diethyl ether, and toluene, but practically insoluble in water and ethanol.

Identification

Dissolve 1 g of this substance in 10 mL of toluene, apply 1 drop of this solution onto a potassium bromide disk, evaporate the solvent to obtain a film and determine the infrared absorption spectrum of this substance as directed in the film method under Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about 2920 cm^{-1}, 2850 cm^{-1}, 1601 cm^{-1}, 1380 cm^{-1}, 760 cm^{-1} and 700 cm^{-1}.

Viscosity

Dissolve 50.0 g of this substance in 150 g of toluene, remove air bubbles, use the solution as the sample solution, and measure viscosity twice: the mean viscosity is 150 - 20000 mPa·s. (Brookfield type viscometer, No. 3, 10-60 rotations, 25±1°C, 1 minute)

Purity

(1) Clarity and color of solution

Dissolve 1.0 g of this substance in 100 mL of toluene: the solution is colorless and clear.

(2) Extractable substances

To 5.0 g of this substance, add 80 mL of water, and boil under a reflux condenser for 30 minutes. After cooling, filter the extract, and add water to the filtrate to make exactly 100 mL. Use this solution as the sample solution for the following tests.

1) pH: 5.0-9.0

2) Chloride

Perform the test with 10 mL of the sample solution as directed under Chloride Limit Test: not more than 0.085%. Prepare the control solution with 1.2 mL of 0.01 mol/L hydrochloric acid

3) Heavy metals: Not more than 20 ppm (20 mL of the sample solution, Method 1, Standard Lead Solution 2 mL)

4) Potassium permanganate-reducing substances

Transfer 25 mL of the sample solution into a glass-stoppered, Erlenmyer flask, add 10.0 mL of 0.002 mol/L potassium permanganate VS and 5 mL of dilute sulfuric acid, and boil for 3 minutes. After cooling, add 0.10 g of potassium iodide, stopper tightly, shake and allow to stand for 10 minutes. Titrate the solution with 0.01 mol/L sodium thiosulfate VS (indicator: 5 drops of starch TS). Perform the test in the same manner, using 25 mL of the blank solution, and obtain the difference of the consumption of 0.002 mol/L potassium permanganate VS between these solutions: not more than 2.0 mL.

(3) Styrene

Weigh exactly 5.0 g of this substance, and dissolve in 50 mL of tetrahydrofuran. Add methanol to make exactly 100 mL, shake vigorously for 10 minutes, centrifuge and use the supernatant liquid as the sample

solution. Separately, weigh exactly 0.10 g of styrene, and add methanol to make exactly 100 mL. Measure exactly 5 mL of the solution, and add methanol to make exactly 100 mL. Measure exactly 1 mL of the solution, add 50 mL of tetrahydrofuran, mix well, add methanol to make exactly 100 mL, and use this solution as the standard solution. Perform the test with 100 μL each of the sample solution and standard solution as directed under Liquid Chromatography according to the following conditions. Determine each peak area from these solutions by the automatic integration method: the peak area of styrene from the sample solution is not larger than the peak area of styrene from the standard solution.

Operating conditions

Detector: An ultraviolet absorption photometer (wavelength: 268 nm)

Column: A stainless steel column, about 4 mm in inside diameter and about 15 cm in length, packed with 10-μm octadecylsilanized silica gel for liquid chromatography

Column temperature: A constant temperature of about 25°C

Mobile phase: A mixture of water and tetrahydrofuran (1:1)

Flow rate: Adjust the flow rate so that the retention time of styrene is about 5 minutes.

Detection sensitivity: Adjust it so that the peak height of styrene obtained from 100 μL of the standard solution is not less than 5 mm.

(4) Lithium

Take 1.0 g of this substance in a crucible, and ignite at 450°C to 500°C to incinerate. After cooling, dissolve it in 2 mL of 0.1 mol/L hydrochloric acid TS, add 10 mL of water, and filter though a glass filter (G4). To this filtrate add water to make exactly 200 mL, and use this solution as the sample solution. Separately, measure exactly 1.0 mL of Standard Lithium Solution for Atomic Absorption Spectrophotometry, and add water to make exactly 100 mL. Measure exactly 10 mL of this solution, add 2 mL of 0.1 mol/L hydrochloric acid TS, add water to make exactly 100 mL, and use this solution as the standard solution. Perform the test with the sample solution and the standard solution as directed under Atomic Absorption Spectrophotometry according to the following conditions: the absorbance of the sample solution is not more than that of the standard solution.

Gas: Combustible gas-Acetylene

Supporting gas-Air

Lamp: Lithium hollow-cathode lamp

Wavelength: 670.8nm

Loss on drying: Not more than 1.0% (1.0 g, 105°C, 4 hours)

Residue on ignition: Not more than 2.0% (Method 1)

Styrene-Butadiene-Styrene Block Copolymer

Definition

Styrene-Butadiene-Styrene Block Copolymer is a block copolymer of polystyrene and polybutadiene. The mean molecular weight is 30000 to 300000.

Description

It occurs as a white to light yellow elastic pellet, crumb or powder solid, and it is odorless or has a faint, characteristic odor.

It is freely soluble in tetrahydrofuran and toluene, but practically insoluble in water and ethanol.

Identification

Dissolve 1 g of this substance in 10 mL of toluene, apply 1 drop of this solution onto a potassium bromide disk, evaporate the solvent to obtain a film and determine the infrared absorption spectrum of this substance as directed in the film method under Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about 2960 cm^{-1}, 2850 cm^{-1}, 1600 cm^{-1}, 1452 cm^{-1}, 965 cm^{-1}, 910 cm^{-1}, and 700 cm^{-1}.

Viscosity

Dissolve 50.0 g of this substance in 150 g of toluene, use the solution as the sample solution, and measure viscosity twice: the mean viscosity is 200 - 20000 mPa·s. (Brookfield type viscometer, No. 3, 10-60 rotations, 25±1°C, 1 minute)

Purity

(1) Clarity and color of solution

Dissolve 1.0 g of this substance in 100 mL of toluene: the solution is colorless and clear.

(2) Extractable substances

To 5.0 g of this substance, add 80 mL of water, and boil under a reflux condenser for 30 minutes. After cooling, filter the extract, and add water to the filtrate to make exactly 100 mL. Use this solution as the sample solution for the following tests.

1) pH: 5.0-9.0

2) Chloride

Perform the test with 10 mL of the sample solution as directed under Chloride Limit Test: not more than 0.085%. Prepare the control solution with 1.2 mL of 0.01 mol/L hydrochloric acid

3) Heavy metals: Not more than 20 ppm (20 mL of the sample solution, Method 1, Standard Lead Solution 2 mL)

4) Potassium permanganate-reducing substances

Transfer 25 mL of the sample solution into a glass-stoppered, Erlenmyer flask, add 10.0 mL of 0.002 mol/L potassium permanganate VS and 5 mL of dilute sulfuric acid, and boil for 3 minutes. After cooling, add 0.10 g of potassium iodide, stopper tightly, shake and allow to stand for 10 minutes. Titrate the solution with 0.01 mol/L sodium thiosulfate VS (indicator: 5 drops of starch TS). Perform the test in the same manner, using 25 mL of the blank solution, and obtain the difference of the consumption of 0.002 mol/L potassium permanganate VS between these solutions: not more than 2.0 mL.

(3) Styrene

Weigh exactly 5.0 g of this substance, and dissolve in 50 mL of tetrahydrofuran. Add methanol to make exactly 100 mL, shake vigorously for 10 minutes, centrifuge and use the supernatant liquid as the sample solution. Separately, weigh exactly 0.10 g of styrene, and add methanol to make exactly 100 mL. Measure exactly 5 mL of the solution, and add methanol to make exactly 100 mL. Measure exactly 1 mL of the

solution, add 50 mL of tetrahydrofuran, mix well, add methanol to make exactly 100 mL, and use this solution as the standard solution. Perform the test with 100 μL each of the sample solution and standard solution as directed under Liquid Chromatography according to the following conditions. Determine each peak area from these solutions by the automatic integration method: the peak area of styrene from the sample solution is not larger than the peak area of styrene from the standard solution.

Operating conditions

Detector: An ultraviolet absorption photometer (wavelength: 268 nm)

Column: A stainless steel column, about 4 mm in inside diameter and about 15 cm in length, packed with 10-μm octadecylsilanized silica gel for liquid chromatography

Column temperature: A constant temperature of about 25°C

Mobile phase: A mixture of water and tetrahydrofuran (1:1)

Flow rate: Adjust the flow rate so that the retention time of styrene is about 5 minutes.

Detection sensitivity: Adjust it so that the peak height of styrene obtained from 100 μL of the standard solution is not less than 5 mm.

(4) Lithium

Take 1.0 g of this substance in a crucible, and ignite at 450°C to 500°C to incinerate. After cooling, dissolve it in 2 mL of 0.1 mol/L hydrochloric acid TS, add 10 mL of water, and filter though a glass filter (G4). To this filtrate add water to make exactly 200 mL, and use this solution as the sample solution. Separately, measure exactly 1.0 mL of Standard Lithium Solution for Atomic Absorption Spectrophotometry, and add water to make exactly 100 mL. Measure exactly 10 mL of this solution, add 2 mL of 0.1 mol/L hydrochloric acid TS, add water to make exactly 100 mL, and use this solution as the standard solution. Perform the test with the sample solution and the standard solution as directed under Atomic Absorption Spectrophotometry according to the following conditions: the absorbance of the sample solution is not more than that of the standard solution.

Gas: Combustible gas-Acetylene

Supporting gas-Air

Lamp: Lithium hollow-cathode lamp

Wavelength: 670.8nm

Loss on drying: Not more than 1.0% (1.0 g, 105°C, 4 hours)

Residue on ignition: Not more than 2.0% (Method 1)

Styrene-Methacrylate Copolymer Solution

Definition

Styrene-Methacrylate Copolymer Solution is an aqueous solution obtained by quaternizing copolymers of styrene and methacrylic acid esters with epichlorohydrin.

Description

It is a white to milky white liquid, and it has a faint odor of acetic acid.

Identification

Determine the infrared absorption spectrum of this substance, previously dried at 105°C for about 2 hours, as directed in the film method under Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about 2920 cm^{-1}, 1730 cm^{-1}, 1490 cm^{-1}, 1450 cm^{-1}, 1380 cm^{-1}, 760 cm^{-1} and 700 cm^{-1}.

pH: 4.0 - 6.0 (1 in 10)

Purity

(1) Heavy metals: Not more than 10 ppm (Method 2)

(2) Arsenic: Not more than 2 ppm (Method 2)

(3) Epichlorohydrin

To 50 g of this substance, add 200 mL of water, and extract the solution with 30 mL of diethyl ether 5 times. Combine the ether extracts, wash with 30 mL of water, dehydrate with 5 g of anhydrous sodium sulfate, and evaporate the ether. Dissolve the residue in 5 mL of acetone, and use this solution as the sample solution. Separately, take 5 mL of acetone solution of epichlorohydrin (1 in 10000) and use this solution as the standard solution. Perform the test with each of the sample solution and standard solution as directed under Gas Chromatography according to the following conditions: the peak area of epichlorohydrin from the sample solution is not larger than the peak area of epichlorohydrin from the standard solution.

Operating conditions

Detector: Hydrogen flame-ionization detector

Column: A column 3-4 mm in inside diameter packed with siliceous earth for gas chromatography (177 to 250 μm) coated with polyethylene glycol 20 M in 10%

Column temperature: From 80 to 140°C

Heating rate: 10°C/min

Carrier gas and flow rate: Adjust the flow rate so that the retention time of nitrogen and epichlorohydrin is about 4 minutes.

Injection volume of sample: 10 μL

Hydrophobic Zeolite

Definition

Hydrophobic Zeolite is hydrophobic zeolite obtained by the reaction of sodium silicate and sodium aluminate.

Description

It is white in color, practically odorless, and contains no foreign matter.

Identification

(1) To 0.1 g of this substance, add 1 mL of 1 mol/L hydrochloric acid, disperse by ultrasonication for 30 seconds, and boil for 5 minutes. After cooling, add 2 mL of water, and filter the solution through a membrane filter with a pore size of 0.45 μm. Add ammonia TS to the filtrate until a white, gelatinous precipitate is produced. Add 5 drops of alizarin S TS: the precipitate changes to red.

(2) Prepare a bead by fusing ammonium sodium hydrogenphosphate tetrahydrate on a platinum loop. Place the bead in contact with this substance and fuse again: an infusible matter appears in the bead, which

changes to an opaque bead with a web-like structure upon cooling.

Purity

(1) Acidity or alkalinity

To 5.0 g of this substance, add 70 mL of water, shake vigorously and boil for 5 minutes. After cooling, add water to make 100 mL, shake well, and centrifuge: the supernatant liquid is neutral.

(2) Heavy metals

Disperse 1.0 g of this substance in 2 mL of water, add 10 mL of dilute hydrochloric acid, shake well, and filter. Wash the residue with 10 mL of water, combine the washing with the filtrate. Add ammonia solution (28) dropwise until a precipitate just appears, and add dropwise dilute hydrochloric acid with vigorous shaking to redissolve the residue. To the solution, add 0.15 g of hydroxylamine hydrochloride, and heat. After cooling, add 0.15 g of sodium acetate, 2 mL of dilute acetic acid and water to make 50 mL. Perform the test using this solution as the sample solution as directed in Method 4: not more than 30 ppm. To 3.0 mL of Standard Lead Solution, add 0.15 g of hydroxylamine hydrochloride, 0.15 g of sodium acetate, 2 mL of dilute acetic acid and water to make 50 mL, and use this solution as the control solution.

(3) Arsenic

Disperse 0.4 g of this substance in 1 mL of water, add 10 mL of dilute hydrochloric acid, and shake well. Perform the test using this solution as the sample solution: not more than 5 ppm.

Loss on drying: Not more than 4.0% (1 g, 105°C, 2 hours)

Absorbent Cotton

Definition

Absorbent Cotton is defatted cotton.

Description

(1) It is white in color, odorless, and contains no foreign matter.

(2) It does not remarkably contain broken pieces of pericarp and seed, or nep.

Identification

It is soluble in ammonium copper TS.

Purity

(1) Coloring matter

Immerse 10 g of this substance in 100 mL of ethanol, press out, transfer 50 mL of the extract into a Nessler tube and observe downward: a yellow color may develop but neither blue nor green color develops.

(2) Acidity or alkalinity

Immerse 10 g of this substance in 100 mL of freshly boiled and cooled water. To 25 mL of the solution, add 3 drops of phenolphthalein TS: no red color develops. Separately, to 25 mL of the same solution, add 1 drop of methyl orange TS: no red color develops.

(3) Fluorescence

Irrdiate this substance with ultraviolet rays (main wavelength: 365 nm) in a dark place: it shows neither

marked fluorescence nor fluorescence by contamination.

(4) Sedimentation velocity

Prepare a test basket, weighing about 3 g from copper wire 0.4 mm in diameter (No. 26) in the form of a cylinder 50 mm in diameter and 80 mm in depth, with 20-mm intervals between the wires. Place 5.0 g of this substance in the test basket, drop the basket on its side gently into the water about 200 mm in depth at ordinary temperature from the height of about 10 mm above the water surface: the basket sinks in water within 8 seconds.

Total ash: Not more than 0.25% (5.0 g)

Linear Low-density Polyethylene (LLDPE)

Definition

Linear Low-density Polyethylene (LLDPE) is a straight-chain low-density polyethylene resin with short-chain branches obtained by the polymerization of ethylene.

Description

It occurs as translucent powder or granules, and it is practically odorless.

Identification

Determine the infrared absorption spectrum of this substance as directed in the film method under Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about 2960 cm^{-1}, 2870 cm^{-1}, 1460 cm^{-1}, 730 cm^{-1} and 720 cm^{-1}.

Specific gravity: 0.85-0.94

Melting point: 90-130°C

Purity

(1) Clarity and color of solution

Dissolve 1 g of this substance in 50 mL of xylene by heating: the solution is colorless and clear.

(2) Heavy metals: Not more than 20 ppm (Method 2)

(3) Arsenic: Not more than 2 ppm (Method 2)

Residue on ignition: Not more than 0.1% (5.0 g, Method 1)

Low-density Polyethylene (LDPE)

Definition

Low-density Polyethylene (LDPE) is a branched low-density polyethylene resin with long-chain branches obtained by the polymerization of ethylene.

Description

It occurs as translucent powder or granules, and it is practically odorless.

Identification

Determine the infrared absorption spectrum of this substance as directed in the film method under Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about 2960 cm^{-1}, 2870 cm^{-1}, 1460 cm^{-1}, 1384 cm^{-1}, 1379 cm^{-1}, 1366 cm^{-1}, 730 cm^{-1} and 720 cm^{-1}.

Specific gravity: 0.85-0.94

Melting point: 90-120°C

Purity

(1) Clarity and color of solution

Dissolve 1 g of this substance in 50 mL of xylene by heating: the solution is colorless and clear.

(2) Heavy metals: Not more than 20 ppm (Method 2)

(3) Arsenic: Not more than 2 ppm (Method 2)

Residue on ignition: Not more than 0.1% (5.0 g, Method 1)

Natural Rubber Thread

Definition

Natural Rubber Thread is obtained by vulcanization of natural rubber.

Description

It occurs as a white elastomer, is practically odorless, and contains no foreign matter.

Purity

(1) Coloring matter

Immerse 10 g of this substance in 100 mL of freshly boiled and cooled water, stir and filter. Transfer 50 mL of the filtrate into a Nessler tube and observe downward: the filtrate is almost colorless.

(2) Acidity or alkalinity

Transfer 10 mL of the filtrate (1) into a test tube 15 mm in inside diameter and add 2 drops of phenolphthalein TS: no red color develops. Separately, to 10 mL of the same solution, add 1 drop of methyl orange TS: no red color develops.

(3) Fluorescence

Irrdiate this substance with ultraviolet rays (main wavelength: 365 nm) in a dark place: it shows neither marked fluorescence nor fluorescence by contamination.

Elasticity

Cut this substance into a 1.5-5.0-mm piece, hold both edges of the thread 100 mm apart and apply a 75-g load: it does not break within 1 minute.

Partial Sodium Salt of Starch-Acrylic Acid Graft Polymer

Definition

Partial Sodium Salt of Starch-Acrylic Acid Graft Polymer is a water-absorbing resin consisting of slightly cross-linked partial sodium salts of starch-acrylic acid graft polymer as a principal component.

Description

(1) It occurs as a white powder and it is practically odorless.

(2) It swells with water but is practically insoluble in water.

(3) Melting point: Not less than 200°C (with decomposition)

Identification

(1) To 1.0 g of this substance, add 100 mL of water, stir and allow to stand for 10 minutes: the solution becomes gelatinous.

(2) To 10 g of the gelatinous substance (1), add 1 mL of calcium chloride TS and shake: a white precipitate is produced.

(3) To 10 g of the gelatinous substance (1), add 1 mL of magnesium sulfate TS and shake: a white precipitate is produced.

(4) To 10 g of the gelatinous substance (1), add 1 mL of cobalt chloride solution (1 in 25), add 2 or 3 drops of ammonium chloride TS and shake: a light red precipitate is produced. Dry the precipitate: the color changes to purple.

(5) To 10 g of the gelatinous substance (1), add 3 drops of iodine TS: a dark blue-purple color is produced.

Purity

(1) Coloring matter

Immerse this substance in ethnol not less than 10 times the mass of this substance, stir for 10 minutes and filter: the filtrate is a colorless clear liquid.

(2) Acidity or alkalinity

To 1.0 g of this substance, add 500 mL of freshly boiled and cooled water and allow to cool. To 25 mL of this solution, add 3 drops of phenolphthalein TS: no red color develops. Separately, to 25 mL of the solution, add 1 drop of methyl orange TS: a yellow color develops.

(3) Fluorescence

Irrdiate this substance with ultraviolet rays (main wavelength: 365 nm) in a dark place: it shows no marked fluorescence.

(4) Heavy metals: Not more than 20 ppm (Method 2)

(5) Acrylic acid

Method 1

To 5.0 g of this substance, add exactly 10 mL of methanol, shake for 4 hours, allow to stand and use the supernatant liquid as the sample solution. Separately, take 0.010 g of the acrylic acid reference standard, dissolve in methanol to make exactly 200 mL and use the solution as the standard solution. Perform the test with 5 μL each of the sample solution and standard solution as directed under Gas Chromatography. Determine the peak heights, Ht and Hs,.of acrylic acid of respective solutions: Ht is not higher than Hs.

Method 2

To 1.0 g of this substance, add 250 mL of saline, stir for 2 hours, filter, and use the resultant solution as the sample solution. Separately, take 0.20 g of acrylic acid reference standard, dissolve in saline to make exactly 100 mL. To 1 mL of the solution, add saline to make exactly 250 mL and use as the standard solution. Perform the test with 20 μL each of the sample solution and the standard solution as directed under Liquid Chromatography. Determine the peak heights, Ht and Hs, of acrylic acid of respective solutions: Ht is not higher than Hs.

Loss on drying: Not more than 15% (2.0 g, 105°C, 3 hours)

Residue on ignition: Not more than 76% (Method 1)

Absorbency

Take 1.0 g of this substance in a nylon woven fabric (10 cm in width, 20 cm in length, 255 mesh), immerse in 1000 mL of saline for 1 hour, allow to stand for 10 minutes, remove excessive water and determine absorbency: it absorbs more than 10 times its weight.

Note) Identify acrylic acid according to Method 1 or Method 2.

Cuprammonium Rayon

Definition

Cuprammonium Rayon is a cellulose fiber obtained by recycling cellulose by cuprammonium method.

Description

It occurs as colorless to light yellow fibrous substances, and it is odorless.

Identification

Determine the infrared absorption spectrum of this substance as directed in the potassium bromide disk method under Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about between 3450 cm^{-1} and 3250 cm^{-1}, 2900 cm^{-1}, 1650 cm^{-1}, between 1430 cm^{-1} and 1370 cm^{-1}, between 1060 cm^{-1} and 970 cm^{-1} and 890 cm^{-1}.

Specific gravity: 1.49-1.51

Melting point: 260-300°C (with decomposition)

Purity

(1) Heavy metals: Not more than 20 ppm (Method 2)

(2) Arsenic: Not more than 2 ppm (Method 2)

Loss on drying

Allow to stand this substance at 20°C and 65% RH for 24 hours, and perform the test with 2.0 g of this substance at 105°C for 3 hours: not more than 13%.

Residue on ignition: Not more than 2.5% (Method 2)

Paraffin

Definition

Paraffin is a mixture of solid hydrocarbons obtained by the polymerization of petroleum.

Description

It occurs as a colorless to white, more or less transparent crystalline mass, and it has a faint, characteristic odor.

Melting point: 70-110°C

Purity

(1) Acidity or alkalinity

Melt 10 g of this substance by heating, add 10 mL of hot ethanol, shake and allow to stand: the ethanol layer is neutral.

(2) Readily carbonizable substances

Take 5 g of this substance in a Nessler tube, melt on an oil bath at 110°C and add 5 mL of sulfuric acid

(94.5- 95.5%). Heat on an oil bath at 110°C for 30 seconds: the sulfuric acid layer has no more color than that of the following control solution.

Control solution: To 3.0 mL of Ferric (II) Chloride Colorimetric Stock Solution, add 1.5 mL of Cobalt (I) Chloride Colorimetric Stock Solution and 0.5 mL of Copper Sulfate Colorimetric Stock Solution, and shake.

(3) Sulfur compounds

To 4.0 g of this substance, add 2 mL of ethanol (99.5) and 2 drops of a transparent sodium hydroxide solution (1 in 5) saturated with lead monoxide, heat at 110°C for 10 minutes with occasional shaking, and allow to cool: no dark color is produced.

(4) Heavy metals: Not more than 30 ppm (Method 3)

(5) Arsenic: Not more than 2 ppm (Method 2)

Residue on ignition: Not more than 0.05% (5.0 g, Method 1)

Paraffin Oil

Definition

Paraffin Oil is a mixture of liquid hydrocarbons obtained from petroleum.

Description

It is a colorless, clear, oily liquid having no fluorescence, and it is odorless or has a faint odor of petroleum while hot.

Specific gravity: d_{20}^{20} 0.81-0.91

Purity

(1) Acidity or alkalinity

Boil 10 mL of this substance with 10 mL of ethanol: the ethanol layer is neutral.

(2) Sulfur compounds

To 4.0 mL of this substance, add 2 mL of ethanol (99.5) and 2 drops of a transparenet sodium hydroxide solution (1 in 5) saturated with lead monoxide, heat at 70°C for 10 minutes with occasional shaking, and allow to cool: no dark color is produced.

(3) Polynuclear aromatic hydrocarbons

Transfer 25 mL of this substance into a 100-mL separator using a 25-mL measuring cylinder, wash the measuring cylinder with 25 mL of n-hexane for ultraviolet-visible spectrophotometry, combine the washings with the liquid in the separator, and shake well. Shake this solution vigorously with 5.0 mL of dimethylsulfoxide for ultraviolet-visible spectrophotometry for 2 minutes, and allow to stand for 15 minutes. Transfer the lower layer into a 50-mL separator, add 2 mL of n-hexane for ultraviolet-visible spectrophotometry, shake vigorously for 2 minutes and allow to stand for 2 minutes. Transfer the lower layer into a glass-stoppered 10-mL centrifuge tube, centrifuge at the rate between 2500 and 3000 rpm for about 10 minutes. Transfer the clear solution so obtained into a cell, stopper tightly, and use this solution as the sample solution. Separately, transfer 25 mL of n-hexane for ultraviolet-visible spectrophotometry into another 50-mL separator, shake vigorously with 5.0 mL of dimethylsulfoxide for ultraviolet-visible

spectrophotometry for 2 minutes, and allow to stand for 2 minutes. Transfer the lower layer into a glass-stoppered 10-mL centrifuge tube, centrifuge at the rate between 2500 and 3000 rpm for about 10 minutes. Transfer the clear solution so obtained into a cell, and stopper tightly. Immediately determine the absorbance of the sample solution using this solution as the blank: it is not more than 0.20 at the wavelength between 260 and 350 nm.

(4) Heavy metals: Not more than 30 ppm (Method 3)

(5) Arsenic: Not more than 2 ppm (Method 2)

Amorphous Propylene-Ethylene Copolymer

Definition

Amorphous Propylene-Ethylene Copolymer is a copolymer of propylene and ethylene. The mean molecular weight is 1000 to 10000.

Description

It occurs as a milky-white to light yellow, slightly viscous solid, and it is odorless or has a faint, characteristic odor.

It is practically insoluble in water, diethyl ether and ethanol, but slightly soluble in toluene and n-heptane.

Identification

Heat and compress this substance at 190°C to make a 50-100-μm film, and determine the infrared absorption spectrum of this substance as directed in the film method under Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about 2960 cm^{-1}, 2850 cm^{-1}, 1460 cm^{-1}, 1380 cm^{-1}, 1156 cm^{-1}, 973 cm^{-1} and 730 cm^{-1}.

Purity

(1) Clarity of solution

Dissolve 1 g of this substance in 100 mL of toluene at 80°C: the solution is clear.

(2) Heavy metals: Not more than 10 ppm (Method 2)

Loss on drying: Not more than 1.0% (50 g, 160°C, 4 hours)

Residue on ignition: Not more than 0.1% (30 g, 900°C, 90 minutes)

Amorphous Propylene-Ethylene-Butene-1 Ternary Copolymer

Definition

Amorphous Propylene-Ethylene-Butene-1 Ternary Copolymer is a ternary copolymer of propylene, ethylene and butane-1. The mean molecular weight is 1000 to 10000.

Description

It occurs as a milky-white to light yellow, slightly viscous solid, and it is odorless or has a faint, characteristic odor.

It is practically insoluble in water, diethyl ether and ethanol, but slightly soluble in toluene and n-heptane.

Identification

Heat and compress this substance at 190°C to make a 50-100-μm film, and determine the infrared absorption

spectrum of this substance as directed in the film method under Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about 2960 cm^{-1}, 2850 cm^{-1}, 1460 cm^{-1}, 1380 cm^{-1}, 1156 cm^{-1}, 973 cm^{-1}, 760 cm^{-1} and 730 cm^{-1}.

Purity

(1) Clarity of solution

Dissolve 1 g of this substance in 100 mL of toluene at 80°C: the solution is clear.

(2) Heavy metals: Not more than 10 ppm (Method 2)

Loss on drying: Not more than 1.0% (50 g, 160°C, 4 hours)

Residue on ignition: Not more than 0.1% (30 g, 900°C, 90 minutes)

Amorphous Propylene-Butene-1 Copolymer

Definition

Amorphous Propylene-Butene-1 Copolymer is a copolymer of propylene and butene-1. The mean molecular weight is 1000 to 10000.

Description

It occurs as a milky-white to light yellow, slightly viscous solid, and it is odorless or has a faint, characteristic odor.

It is practically insoluble in water, diethyl ether and ethanol, but slightly soluble in toluene and n-heptane.

Identification

Heat and compress this substance at 190°C to make a 50-100-μm film, and determine the infrared absorption spectrum of this substance as directed in the film method under Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about 2960 cm^{-1}, 2850 cm^{-1}, 1460 cm^{-1}, 1380 cm^{-1}, 1156 cm^{-1}, 973 cm^{-1} and 760 cm^{-1}.

Purity

(1) Clarity of solution

Dissolve 1 g of this substance in 100 mL of toluene at 80°C: the solution is clear.

(2) Heavy metals: Not more than 10 ppm (Method 2)

Loss on drying: Not more than 1.0% (50 g, 160°C, 4 hours)

Residue on ignition: Not more than 0.1% (30 g, 900°C, 90 minutes)

Amorphous Polypropylene Resin

Definition

Amorphous Polypropylene Resin is a polymer of propylene. The mean molecular weight is 1000 to 10000.

Description

It occurs as a milky-white to light yellow, slightly viscous solid, and it is odorless or has a faint, characteristic odor.

It is practically insoluble in water, diethyl ether and ethanol, but slightly soluble in toluene and n-heptane.

Identification

Heat and compress this substance at 190°C to make a 50-100-μm film, and determine the infrared absorption spectrum of this substance as directed in the film method under Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about 2960 cm^{-1}, 2850 cm^{-1}, 1460 cm^{-1}, 1380 cm^{-1}, 1156 cm^{-1} and 973 cm^{-1}.

Purity

(1) Clarity of solution

Dissolve 1 g of this substance in 100 mL of toluene at 80°C: the solution is clear.

(2) Heavy metals: Not more than 10 ppm (Method 2)

Loss on drying: Not more than 1.0% (50 g, 160°C, 4 hours)

Residue on ignition: Not more than 0.1% (30 g, 900°C, 90 minutes)

Emulsion of Rosin Denatured with Fumaric Acid

Definition

Emulsion of Rosin Denatured with Fumaric Acid is an emulsion obtained by the emulsification of rosin denatured with fumaric acid with emulsifying agent.

Description

It is a white liquid and it is odorless or has a faint, characteristic odor.

Identification

Determine the infrared absorption spectrum of this substance, previously dried at 105 °C for about 2 hours, as directed in the film method under Infrared Spectrophotometry; it exhibits absorption at the wave number of about 1700 cm^{-1}.

pH: 4.0-6.5

Purity

(1) Heavy metals: Not more than 10 ppm (Method 2)

(2) Arsenic: Not more than 2 ppm (Method 2)

Aromatic Denatured Terpene Resin

Definition

Aromatic Denatured Terpene Resin is a synthetic resin obtained by hydrogenating a copolymer of terpene hydrocarbon compound and aromatic hydrocarbon compound having a substituent.

Description

It occurs as a light yellow, translucent, bead-like or flaky, easily-breakable solid, and it is practically odorless. It is freely soluble in chloroform and toluene, but practically insoluble in water and ethanol.

Identification

Dissolve about 1 g of this substance in 5 mL of chloroform, apply lightly this solution on the disk, evaporate the chloroform to make a film, and determine the infrared absorption spectrum of this substance as directed in the film method under Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about 2900 cm^{-1}, 1600 cm^{-1}, 1450 cm^{-1} and 1375 cm^{-1}.

Acid value: Not more than 2.0 (Method 1)

Dissolve this substance in a mixture of toluene and ethanol (1:1). Use this solution for the test.

Heavy metals: Not more than 10 ppm (Method 2)

Loss on drying: Not more than 1% (1.0 g, 105°C, 4 hours)

Residue on ignition: Not more than 0.1% (10 g, 800°C)

Polyacrylamide Solution

Definition

Polyacrylamide Solution is a solution of copolymer of polyacrylamide.

Description

It is a light yellow, clear liquid, and it is odorless or has a faint, characteristic odor.

Identification

Determine the infrared absorption spectrum of this substance, previously dried at 105°C for about 2 hours, as directed in the film method under Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about 3380 cm^{-1}, 1660 cm^{-1}, 1610 cm^{-1} (amide), 1460 cm^{-1} and 1130 cm^{-1}.

pH: 4.0-9.0

Purity

(1) Heavy metals: Not more than 20 ppm (Method 2)

(2) Arsenic: Not more than 2 ppm (Method 2)

(3) Acrylic unreacted monomer: Not more than 1.5% (1.0 g)

Polyacrylamide-Polyvinyl Alcohol Copolymer Emulsion

Definition

Polyacrylamide-Polyvinyl Alcohol Copolymer Emulsion is a copolymer emulsion of polyvinyl alcohol and amide polyacrylate.

Description

It is a viscous, opaque liquid, and it is practically odorless.

Identification

(1) Identification of polyvinyl alcohol

To 5 mL of this substance, add 1 drop of iodine TS: a dark blue or red color is produced. Separately, take 5 mL of this substance and add 10 mL of ethanol: a cotton-like precipitation is produced.

(2) Identification of amide polyacrylate

Determine the infrared absorption spectrum of this substance, previously dried at 105°C for about 2 hours, as directed in the film method under Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about 3380 cm^{-1}, 1660 cm^{-1}, 1610 cm^{-1} (amide), 1460 cm^{-1} and 1130 cm^{-1}.

Purity

(1) Heavy metals: Not more than 20 ppm (Method 2)

(2) Arsenic: Not more than 2 ppm (Method 2)

(3) Acrylic unreacted monomer: Not more than 1.5% (1.0 g)

Polyester-Copolymer Polyester Bicomponent Fiber

Definition

Polyester-Copolymer Polyester Bicomponent Fiber is a polyester (polyethylene terephthalate)-core/copolymer polyester (polyethylene terephthalate/isophthalate copolymer polyester)-sheath bicomponent fiber.

Description

It occurs as colorless to white fibrous substances, and it is odorless.

Identification

(1) Determine the infrared absorption spectrum of this substance as directed in the film method under Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about 1720 cm^{-1}, 1580 cm^{-1}, 1500 cm^{-1}, 1410 cm^{-1}, 1260 cm^{-1}, 1100 cm^{-1}, 1015 cm^{-1}, 870 cm^{-1} and 725 cm^{-1}.

(2) Place this substance near a flame. It melts and burns, and a black hard round ash remains.

Specific gravity: 1.37-1.38

Melting point: Polyester: 255°C - 260°C

Polyester copolymer: 110°C (softening point, observed with naked eye)

Purity

(1) Heavy metals: Not more than 20 ppm (Method 2)

(2) Arsenic: Not more than 2 ppm (Atomic Absorption Spectrophotometry)

Residue on ignition: Not more than 4% (Method 2)

Polyethylene Terephthalate Resin (PET)

Definition

Polyethylene Terephthalate Resin (PET) is a polyethylene terephthalate resin obtained by the esterification or transesterification of terephthalic acid or dimethyl terephthalate and ethylene glycol, followed by polycondensation.

Description

It occurs as translucent powder or granules, and it is practically odorless.

Identification

Determine the infrared absorption spectrum of this substance as directed in the film method under Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about 1720 cm^{-1}, 1580 cm^{-1}, 1250 cm^{-1}, 1100 cm^{-1}, 1015 cm^{-1}, 870 cm^{-1} and 725 cm^{-1}.

Specific gravity: 1.35-1.39

Melting point: 200-260°C

Purity

(1) Heavy metals: Not more than 20 ppm (Method 2)

(2) Arsenic: Not more than 2 ppm (Method 2)

Residue on ignition: Not more than 0.1% (5.0 g, Method 1)

Polyethylene Terephthalate Fiber

Definition

Polyethylene Terephthalate Fiber is a polyethylene terephthalate fiber obtained by the esterification or transesterification of terephthalic acid or dimethyl terephthalate and ethylene glycol, followed by polycondensation.

Description

It occurs as colorless to white fibrous substances, and it is odorless.

Identification

(1) Determine the infrared absorption spectrum of this substance as directed in the film method under Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about 1720 cm^{-1}, 1580 cm^{-1}, 1250 cm^{-1}, 1100 cm^{-1}, 1015 cm^{-1}, 870 cm^{-1} and 725 cm^{-1}.

(2) Place this substance near a flame. It melts and burns, and a black hard round ash remains.

Specific gravity: 1.38-1.39

Melting point: 250-260°C

Purity

(1) Heavy metals: Not more than 20 ppm (Method 2)

(2) Arsenic: Not more than 2 ppm (Atomic Absorption Spectrophotometry)

Residue on ignition: Not more than 2.5% (Method 2)

Polyethylene Terephthalate/Polyethylene Bicomponent Fiber

Definition

Polyethylene Terephthalate/Polyethylene Bicomponent Fiber is a polyester (polyethylene terephthalate)-core/polyethylene-sheath bicomponent fiber.

Description

It occurs as colorless to white fibrous substances, and it is odorless.

Identification

Determine the infrared absorption spectrum as directed in the film method under Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about 2980 cm^{-1}, 2910 cm^{-1}, 1720 cm^{-1}, 1580 cm^{-1}, 1450 cm^{-1}, 1250 cm^{-1}, 1100 cm^{-1}, 1015 cm^{-1}, 870 cm^{-1} and 725 cm^{-1}.

Specific gravity: 1.07-1.37

Melting point: Polyester: 250-260°C

Polyethylene: 115-135°C

Purity

(1) Heavy metals: Not more than 20 ppm (Method 2)

(2) Arsenic: Not more than 2 ppm (Atomic Absorption Spectrophotometry)

Residue on ignition: Not more than 4% (Method 2)

Polyethylene Oxide

Definition

Polyethylene Oxide is a water-soluble polymer obtained by the ring-opening polymerization of ethylene oxide. The mean molecular weight is 2,000,000 to 10,000,000.

Description

It occurs as a white powder, and it is odorless or has a faint, characteristic odor.

Identification

Shake 0.2 g of this substance with 10 mL of water and 5 mL of ammonium thiocyanate-cobalt nitrate TS, and allow to stand: a blue color develops in the chloroform layer.

Viscosity

The viscosity of a solution (1 in 200) is 100-1000 mPa·s. (Brookfield type viscometer, No. 2, 12 rotations, 25°C, constant)

Purity

(1) Heavy metals: Not more than 20 ppm (Method 2)

(2) Arsenic: Not more than 2 ppm (Method 2)

Loss on drying: Not more than 4.0% (2.0 g, 105°C, 3 hours)

Residue on ignition: Not more than 5.0% (Method 1)

Polyethylene Resin

Definition

Polyethylene Resin is a polyethylene resin obtained by the polymerization of ethylene.

Description

It occurs as translucent powder or granules, and it is practically odorless.

Identification

Determine the infrared absorption spectrum as directed in the film method under Infrared Spectrophotometry: it exhibits absorption of polymer n-paraffin homologues.

Specific gravity: 0.85-1.00

Melting point: 90-140°C

Purity

(1) Clarity and color of solution

Dissolve 1.0 g of this substance in 50 mL of xylene by heating: the solution is colorless and clear.

(2) Heavy metals: Not more than 20 ppm (Method 2)

(3) Arsenic: Not more than 2 ppm (Method 2)

Residue on ignition: Not more than 0.1% (5.0 g, Method 1)

Polyethylene Fiber

Definition

Polyethylene Fiber is a fiber of polyethylene obtained by the polymerization of ethylene.

Description

It occurs as colorless to white fibrous substances, and it is odorless.

Identification

(1) Determine the infrared absorption spectrum as directed in the film method under Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about 2900 cm^{-1}, 1470 cm^{-1}, 1370 cm^{-1}, 740 cm^{-1} and 720 cm^{-1}.

(2) Place this substance near a flame. It melts and burns with fumes emitting an odor of paraffin. A gray hard bead-like ash remains.

Specific gravity: 0.93-0.96

Melting point: 120-135°C

Purity

(1) Heavy metals: Not more than 20 ppm (Method 2)

(2) Arsenic: Not more than 2 ppm (Method 2)

Residue on ignition: Not more than 2.5% (Method 2)

Polyethylene/Polypropylene Bicomponent Fiber

Definition

Polyethylene/Polypropylene Bicomponent Fiber is a polypropylene-core/polyethylene-sheath or side-by-side bicomponent fiber.

Description

It occurs as colorless to white fibrous substances, and it is odorless.

Identification

(1) Determine the infrared absorption spectrum as directed in the film method under Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about 2980 cm^{-1}, 2930 cm^{-1}, 2830 cm^{-1}, 1465 cm^{-1}, 1455 cm^{-1}, 1375 cm^{-1}, 1255 cm^{-1}, 1165 cm^{-1}, 995 cm^{-1}, 970 cm^{-1}, 840 cm^{-1}, 810 cm^{-1}, 740 cm^{-1} and 725 cm^{-1}.

(2) Place this substance near a flame. It melts and burns with fumes emitting an odor of paraffin. A gray hard bead-like ash remains.

Specific gravity: 0.91-1.01

Melting point: Polypropylene: 160-170°C

Polyethylene: 115-135°C

Purity

(1) Heavy metals: Not more than 20 ppm (Method 2)

(2) Arsenic: Not more than 2 ppm (Method 2)

Residue on ignition: Not more than 4% (Method 2)

Polyvinyl Chloride Fiber (PVC Fiber)

Definition

Polyvinyl Chloride Fiber (PVC Fiber) is a fiber of polyvinyl chloride obtained by the suspension

polymerization of vinyl chloride.

Description

It occurs as colorless to white fibrous substances, and it is odorless.

Identification

(1) Determine the infrared absorption spectrum of this substance as directed in the potassium bromide disk method under Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about 2950 cm^{-1}, 1420 cm^{-1}, 1240 cm^{-1}, 1070 cm^{-1}, 960 cm^{-1} and 700 cm^{-1}.

(2) When burned, it softens and shrinks with fume and becomes a black block coal.

Specific gravity: 1.39

Melting point: 200-210°C

Purity

Vinyl chloride

Take 1.0 g of this substance in a 20-mL volumetric flask. Add about 10 mL of tetrahydrofuran for gas chromatography, dissolve by occasional shaking in a cold place, add tetrahydrofuran for gas chromatography, previously cooled, to make 20 mL while cooling, and use this solution as the sample solution. Perform the test with 2 μL each of the sample solution and Standard Vinyl Chloride Solution as directed under Gas Chromatography according to the following conditions. Determine the peak heights, Ht and Hs, of vinyl chloride of respective solutions: Ht is not higher than Hs.

Operating conditions

Detector: Hydrogen flame-ionization detector

Column: A column about 3 mm in inside diameter and 2 or 3 m in length, packed with siliceous earth for gas chromatography (150 to 180 μm) coated with polypropylene glycol for gas chromatography in 10-15%

Column temperature: A constant temperature of about 60-70°C

Carrier gas: Nitrogen

Flow rate: Adjust the flow rate so that the retention time of vinyl chloride is about 1.5 minutes.

Selection of column: Proceed with 2 μL of Standard Vinyl Chloride Solution under the above operating conditions. Use a column from which vinyl chloride and ethanol are eluted in that order, with a good resolution between their peaks.

Detection sensitivity: Adjust it so that the peak height of vinyl chloride obtained from 2 μL of the Standard Vinyl Chloride Solution is 50 to 70 mm.

Loss on drying: Not more than 1.0% (1.0 g, 105°C, 2 hours)

Residue on ignition: Not more than 2.5% (Method 2)

Polyvinyl Alcohol

Definition

Polyvinyl Alcohol is a polymer obtained by saponifying polyvinyl acetate and is expressed as $-[CH_2-CHOH]n-[CH_2-CHOCOCH_3]m-$. The viscosity of this substance is expressed as mPa·s. Usually, it is

between 2 mPa·s and 100 mPa·s.

Description

It occurs as colorless to pale yellowish white granules, powder or fibrous substances, and it is odorless or has a faint odor of acetic acid.

It is practically insoluble in ethanol, diethyl ether, and chloroform.

To this substance add water, and heat: A clear, viscous solution is obtained.

It is hygroscopic.

Identification

(1) Dissolve 0.5 g of this substance in 10 mL of water by heating, cool, add 1 drop of iodine TS to 5 mL of this solution and allow to stand: a dark red to blue color develops.

(2) Dissolve 0.01 g of this substance in 100 mL of water by heating, cool, add 1 drop of iodine TS to 5 mL of this solution, mix, and add 5 mL of a solution of boric acid (1 in 25): a blue color develops.

(3) To 2 mL of the solution obtained in (1), add 5 mL of ethanol: a white cotton-like precipitate is produced.

Viscosity: 85-115% of the labeled value (mPa·s)

Take 4.000 g of this substance, previously dried, add 95 mL of water, allow to stand for 30 minutes and dissolve by heating under a reflux condenser for 2 hours while stirring. After cooling, add water to make 100.0 g, and mix. Allow to stand still to remove bubbles and perform the test at 20±0.1°C as directed in Method 1.

pH: 5.0 - 8.0 (1 in 25)

Saponification value: Not less than 70 mol%.

Weigh accurately the amount as directed in Table 1 according to the estimated saponification value, previously dried, transfer into a glass-stoppered conical flask, add 100 mL of water, and dissolve by heating while stirring for 2 hours. After cooling, add exactly 25 mL of 0.1 mol/L or 0.5 mol/L sodium hydroxide VS according to Table 1, stopper tightly, and allow to stand for 2 hours. Then add exactly 25 mL of sulfuric acid at the same concentration as that of sodium hydroxide VS, shake well, and titrate with 0.1 mol/L or 0.5 mol/L sodium hydroxide VS according to Table 1 (indicator: 3 drops of phenolphthalein TS). Perform a blank determination in the same manner.

$$\text{Saponification value (mol\%)}: 100 - \frac{44.05A}{60.05-0.42A}$$

$$A=\frac{0.6005\times(a-b)FD}{\text{Amount (g) of sample}}$$

a: Volume (mL) of 0.1 mol/L or 0.5 mol/L sodium hydroxide VS consumed

b: Volume (mL) of 0.1 mol/L or 1.0 mol/L sodium hydroxide VS consumed in the blank determination

F: Molarity factor of 0.1 mol/L or 0.5 mol/L sodium hydroxide VS

D: Concentration of sodium hydroxide VS (0.1 mol/L or 0.5 mol/L)

Table 1 Estimated saponification value, and amount of the sample and specified solution for use

Estimated saponification value mol%	Amount of sample G	Solution specified for use	
		Concentration mol/L	Used amount mL
Not less than 97	3	0.1	25.00
Not less than 90, less than 97	3	0.5	25.00
Not less than 80, less than 90	2	0.5	25.00
Not less than 70, less than 80	1	0.5	25.00

Purity

(1) Clarity and color of solution

To 1.0 g of this substance, add 20 mL of water, disperse by stirring well, heat for not less than 2 hours while stirring and cool: the solution is colorless and clear.

(2) Heavy metals: Not more than 10 ppm (2.0 g, Method 2, Standard Lead Solution 2.0 mL)

(3) Arsenic: Not more than 2 ppm (Method 2)

Loss on drying: Not more than 6.0% (1.0 g, 105°C, 3 hours)

Residue on ignition: Not more than 2% (Method 1)

Polypropylene Copolymer Fiber

Definition

Polypropylene Copolymer Fiber is a fiber of propylene-ethylene copolymer obtained by copolymerizing propylene and ethylene.

Description

It occurs as colorless to white fibrous substances, and it is odorless.

Identification

Determine the infrared absorption spectrum as directed in the film method under Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about 2950 cm^{-1}, 2920 cm^{-1}, 2830 cm^{-1}, 1455 cm^{-1}, 1375 cm^{-1}, 1255 cm^{-1}, 1165 cm^{-1}, 970 cm^{-1}, 840 cm^{-1} and 720 cm^{-1}.

Specific gravity: 0.89 - 0.90

Melting point: 148°C

Purity

(1) Heavy metals: Not more than 20 ppm (Method 2)

(2) Arsenic: Not more than 2 ppm (Method 2)

Residue on ignition: Not more than 4% (Method 2)

Polypropylene/Copolymer Polypropylene Bicomponent Fiber

Definition

Polypropylene/Copolymer Polypropylene Bicomponent Fiber is a polypropylene-core/polypropylene copolymer (propylene-ethylene copolymer)-sheath or side-by-side bicomponent fiber.

Description

It occurs as colorless to white fibrous substances, and it is odorless.

Identification

(1) Determine the infrared absorption spectrum as directed in the film method under Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about 2980 cm^{-1}, 2940 cm^{-1}, 2830 cm^{-1}, 1460 cm^{-1}, 1380 cm^{-1}, 1255 cm^{-1}, 1165 cm^{-1}, and 710 cm^{-1}.

(2) Place this substance near a flame. It melts and burns with fumes emitting an odor of paraffin. A gray hard bead-like ash remains.

Specific gravity: 0.91-0.94

Melting point: Polypropylene: 160-170°C

Copolymer polypropylene: 115-148°C

Purity

(1) Heavy metals: Not more than 20 ppm (Method 2)

(2) Arsenic: Not more than 2 ppm (Method 2)

Residue on ignition: Not more than 4% (Method 2)

Polypropylene Resin (PP)

Definition

Polypropylene Resin (PP) is a polypropylene resin obtained by polymerizing propylene.

Description

It occurs as translucent powder or granules, and it is practically odorless.

Identification

Determine the infrared absorption spectrum as directed in the film method under Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about 2930 cm^{-1}, 2830 cm^{-1}, 1455 cm^{-1}, 1375 cm^{-1}, 1255 cm^{-1}, 1165 cm^{-1}, 995 cm^{-1}, 970 cm^{-1}, 840 cm^{-1} and 810 cm^{-1}.

Specific gravity: 0.89-0.94

Melting point: 150-170°C

Purity

(1) Clarity and color of solution

Dissolve 1 g of this substance in 50 mL of xylene by heating: the solution is colorless and clear.

(2) Heavy metals: Not more than 20 ppm (Method 2)

(3) Arsenic: Not more than 2 ppm (Method 2)

Residue on ignition: Not more than 0.1% (5.0 g, Method 1)

Polypropylene Fiber

Definition

Polypropylene Fiber is a fiber obtained by the polymerization of propylene.

Description

It occurs as colorless to white fibrous substances, and it is odorless.

Identification

(1) Determine the infrared absorption spectrum as directed in the film method under Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about 2930 cm^{-1}, 2830 cm^{-1}, 1455 cm^{-1}, 1375 cm^{-1}, 1255 cm^{-1}, 1165 cm^{-1}, 995 cm^{-1}, 970 cm^{-1}, 840 cm^{-1} and 810 cm^{-1}.

(2) Place this substance near a flame. It melts and burns with fumes emitting an odor of paraffin. A gray hard bead-like ash remains.

Specific gravity: 0.89-0.94

Melting point: 160-170°C

Purity

(1) Heavy metals: Not more than 20 ppm (Method 2)

(2) Arsenic: Not more than 2 ppm (Method 2)

Residue on ignition: Not more than 2.5% (Method 2)

Solution of Petroleum Resin Denatured with Maleic Acid

Definition

Solution of Petroleum Resin Denatured with Maleic Acid is obtained by adding an aqueous solution of potassium hydroxide to warmed maleinized petroleum resin and maleinized rosin, followed by neutralization while well stirring, then emulsification and dispersion by adding water, cooling and filtration.

Description

It is a pale yellow-brown, translucent liquid, and it has a characteristic odor.

Identification

Dissolve 1.0 g of this substance in 5 mL of water, neutralize with 0.2 mL of hydrochloric acid, add 10 mL of diethyl ether and stir. Take the ether layer, evaporate the solvent and determine the infrared absorption spectrum as directed in the potassium bromide disk method under Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about 1860 cm^{-1}, 1780 cm^{-1}, 1700 cm^{-1}, 720 cm^{-1} and 700 cm^{-1}.

pH: 9.5-10.5 (1 in 6)

Purity

(1) Heavy metals: Not more than 10 ppm (Method 2)

(2) Arsenic: Not more than 2 ppm (Method 2)

Solution of Rosin Denatured with Maleic Acid

Definition

Solution of Rosin Denatured with Maleic Acid is an aqueous solution of the alkali metal salt of rosin denatured with maleic acid.

Description

It is a brown, clear liquid, and it has a characteristic odor of rosin.

Identification

Determine the infrared absorption spectrum of this substance, previously dried at 105 °C for about 2 hours, as

directed in the film method under Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about between 3000 cm^{-1} and 2800 cm^{-1}, 1570 cm^{-1}, and 700 cm^{-1}.

pH: 9.0-11.0

Purity

(1) Heavy metals: Not more than 10 ppm (Method 2)

(2) Arsenic: Not more than 2 ppm (Method 2)

α-Methylstyrene-group Resin

Definition

α-Methylstyrene-group Resin is an oligomer obtained by the polymerization of α-methylstyrene monomer (50-90%) and styrene monomer (10-50%) using boron trifluoride as a catalyst. The mean molecular weight is 600 to 5000.

Description

It occurs as a white, slightly viscous solid, and it is freely soluble in acetone and toluene, but insoluble in water and methanol.

Identification

Dissolve about 4.0 g of this substance in 100 mL of carbon tetrachloride and inject the solution into a fixed cell of sodium chloride. Perform the test as directed in the Solution method under Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about 2970 cm^{-1} and 2930 cm^{-1}.

Purity

(1) Clarity of solution

To 1 g of this substance, add 100 mL of toluene and heat on a water bath: the solution is clear.

(2) Heavy metals: Not more than 50 ppm (0.5 g, Method 2, Standard Lead Solution 2.5 mL)

Loss on drying: Not more than 1.0% (1.0 g, 105°C, 4 hours)

Residue on ignition: Not more than 0.1% (1.0 g, 450-550°C)

Flocculent Pulp

Definition

Flocculent Pulp is a flocculent chemical pulp.

Description

(1) It is white in color, odorless, and contains no foreign matter.

(2) It does not remarkably contain fiber mass.

Purity

(1) Lignin

Dissolve 0.1 g of phloroglucin in 15 mL of hydrochloric acid, add water to make 20 mL and drop onto this substance: no marked pink or red color develops.

(2) Coloring matter

Immerse 10 g of this substance in 100 mL of ethanol, press out, transfer 50 mL of the extract into a

Nessler tube and observe downward: a yellow color may develop but neither blue nor green color develops.

(3) Acidity or alkalinity

To 10 g of this substance, add 100 mL of freshly boiled and cooled water and allow to cool. To 25 mL of the solution, add 3 drops of phenolphthalein TS: no red color develops. Separately, to 25 mL of the same solution, add 1 drop of methyl orange TS: no red color develops.

(4) Fluorescence

Irrdiate this substance with ultraviolet rays (main wavelength: 365 nm) in a dark place: it shows neither marked fluorescence nor fluorescence by contamination.

(5) Sedimentation velocity

Prepare a test basket, weighing about 3 g from copper wire 0.4 mm in diameter (No. 26) in the form of a cylinder 50 mm in diameter and 80 mm in depth, with 20-mm intervals between the wires. Place 5.0 g of this substance in the test basket, drop the basket on its side gently into the water about 200 mm in depth at ordinary temperature from the height of about 10 mm above the water surface: the basket sinks in water within 8 seconds.

Total ash: Not more than 0.65% (5.0 g)

Sorbitan Monolaurate

Definition

Sorbitan Monolaurate consists mainly of laurate monoester of sorbitan.

Description

It is a pale yellow to yellow-brown liquid, and it has a faint, characteristic odor.

Identification

(1) To 0.5 g of this substance, add 5 mL of ethanol, dissolve by heating on a water bath, add 5 mL of dilute sulfuric acid, and heat further for 30 minutes and cool: oily drops or a white to yellowish white solid is precipitated. This separated oily drops or solid dissolves when shaken with 5 mL of diethyl ether.

(2) Shake 2 mL of the separately oily drops or solid in (1) with 2 mL of freshly prepared catechol solution (1 in 10), then with 5 mL of sulfuric acid: a red to red-brown color develops.

(3) Saponify 5 g of this substance using the saponification method and completely evaporate ethanol. Dissolve the residue in 50 mL of water, acidify with hydrochloric acid (indicator: methyl orange TS), and extract the residue with 30 mL of diethyl ether twice. Combine the ether layers, wash with 20 mL portions of water until the washings become neutral, and evaporate the ether on a water bath: the acid value of the residue is between 260 to 280 (0.5 g, Method 1). Use 50 mL of the 0.5 mol/L ethanol solution of potassium hydroxide for saponification.

Acid value: Not more than 13 (2.0 g, Method 2)

Saponification value: 155-174

Purity

(1) Heavy metals: Not more than 20 ppm (Method 2)

(2) Arsenic: Not more than 2 ppm (Method 2)

Loss on drying: Not more than 3.0% (5.0 g, 105°C, 1 hour)

Residue on ignition: Not more than 1.0% (3.0 g, Method 3)

Cotton

Definition

Cotton is cotton wool adherent to seeds of raw cotton.

Description

(1) It is white in color, odorless, and contains no foreign matter.

(2) It does not remarkably contain broken pieces of pericarp and seed, or nep.

Identification

It is soluble in ammonium copper TS and insoluble in ethanol.

Purity

(1) Coloring matter

Immerse 10 g of this substance in 100 mL of ethanol, press out, transfer 50 mL of the extract into a Nessler tube and observe downward: a yellow color may develop but neither blue nor green color develops.

(2) Acidity or alkalinity

To 10 g of this substance, add 100 mL of freshly boiled and cooled water and allow to cool. To 25 mL of the solution, add 3 drops of phenolphthalein TS: no red color develops. Separately, to 25 mL of the same solution, add 1 drop of methyl orange TS: no red color develops.

(3) Fluorescence

Irrdiate this substance with ultraviolet rays (main wavelength: 365 nm) in a dark place: it shows neither marked fluorescence nor fluorescence by contamination.

Total ash: Not more than 0.25% (5.0 g)

Aluminum Sulfate (Solution)

Definition

Aluminum Sulfate (Solution) is an aqueous solution containing not less than 8.0% and not more than 8.2% of aluminum sulfate [$Al_2(SO_4)\cdot 18H_2O$].

Description

It is a colorless to light yellow-brown, clear liquid, and it is odorless.

Identification

(1) It responds to the Qualitative Tests for aluminum salt.

(2) It responds to the Qualitative Tests (1) and (2) for sulfate.

pH: 3.0-4.0 (2 w/v% solution of this substance)

Purity

(1) Iron

Transfer 1.0 g of this substance into a Nessler tube, add 6 mL of dilute nitric acid and water to make 20 mL. Add 0.05 g of ammonium persulfate and 5 mL of ammonium thiocyanate TS, shake, add 15 mL of n-butanol and shake vigorously for 30 seconds: the n-butanol layer has no more color than the following control solution.

Control solution: Using 2.0 mL of Standard Iron Solution instead of this substance, perform the test in the same manner.

(2) Heavy metals: Not more than 10 ppm (Method 1)

(3) Arsenic: Not more than 2 ppm (0.40 g, Method 1)

Flocculent Rayon

Definition

Flocculent Rayon is flocculent regenerated fiber made from plant-based fibers.

Description

It is white in color, odorless, and contains no foreign matter.

Identification

It is soluble in sulfuric acid. It swells with ammonium copper TS and then dissolves.

Purity

(1) Coloring matter

Immerse 10 g of this substance in 100 mL of ethanol, press out, transfer 50 mL of the extract into a Nessler tube and observe downward: a yellow color may develop but neither blue nor green color develops.

(2) Acidity or alkalinity

To 10 g of this substance, add 100 mL of freshly boiled and cooled water and allow to cool. To 25 mL of the solution, add 3 drops of phenolphthalein TS: no red color develops. Separately, to 25 mL of the same solution, add 1 drop of methyl orange TS: no red color develops.

(3) Fluorescence

Irrdiate this substance with ultraviolet rays (main wavelength: 365 nm) in a dark place: it shows neither marked fluorescence nor fluorescence by contamination.

(4) Sedimentation velocity

Prepare a test basket, weighing about 3 g from copper wire 0.4 mm in diameter (No. 26) in the form of a cylinder 50 mm in diameter and 80 mm in depth, with 20-mm intervals between the wires. Place 5.0 g of this substance in the test basket, drop the basket on its side gently into the water about 200 mm in depth at ordinary temperature from the height of about 10 mm above the water surface: the basket sinks in water within 8 seconds..

Total ash: Not more than 0.25% (5.0 g)

Not more than 1.2% (5.0 g) (delustered)

Rayon Fiber

Definition

Rayon Fiber is cellulose fiber obtained by regenerating cellulose using the viscose method.

Description

It occurs as colorless to light yellow fibrous substances, and it is practically odorless.

Identification

(1) Determine the infrared absorption spectrum as directed in the potassium bromide disk method under Infrared Spectrophotometry: it exhibits absorption at the wave numbers of about 2900 cm^{-1}, 1650 cm^{-1} and 890 cm^{-1}.

(2) Burn this substance: it emits an odor of burning paper, and the residual ash is thin and has a black or gray color.

(3) It is soluble in ammonium copper TS.

Specific gravity: 1.50-1.52

Melting point: 260-300°C (with decomposition)

Purity

(1) Heavy metals: Not more than 20 ppm (Method 2)

(2) Arsenic: Not more than 2 ppm (Method 2)

Loss on drying: Not more than 11.0% (2.0 g, 105°C, 3 hours)

Residue on ignition: Not more than 2.5% (Method 2)

Part 2 - Colorants

Silicon Dioxide

C.I. Acid Blue 9 (Blue No. 205)

C.I. Acid Blue 74 (Blue No. 2)

C.I. Acid Red 51 (Red No. 3)

C.I. Direct Yellow 12

C.I. Direct Orange 26

C.I. Direct Violet 51

C.I. Direct Blue 1

C.I. Direct Blue 86

C.I. Direct Blue 106

C.I. Direct Blue 203

C.I. Direct Red 23

C.I. Direct Red 31

C.I. Direct Red 80

C.I. Direct Red 81

C.I. Direct Red 227

C.I. Vat Blue 1 (Blue No. 201)

C.I. Pigment Yellow 1 (Yellow No. 401)

C.I. Pigment Yellow 12 (Yellow No. 205)

C.I. Pigment Yellow 14

C.I. Pigment Yellow 83

C.I. Pigment Orange 13 (Orange No. 204)

C.I. Pigment Green 7

C.I. Pigment Violet 19

C.I. Pigment Violet 23

C.I. Pigment Blue 15 (Blue No. 404)

C.I. Pigment Blue 27 (Iron Blue)

C.I. Pigment Brown 6 (Iron Oxide Brown)

C.I. Pigment Brown 24 (Chrome Titan Yellow)

C.I. Pigment Black 7 (Carbon Black)

C.I. Pigment White 4 (Zinc Oxide)

C.I. Pigment White 6 (Titanium Dioxide)

C.I. Pigment White 18 (Calcium Carbonate)

C.I. Pigment White 19 (Kaolin)

C.I. Pigment White 21 (Barium Sulfate)

C.I. Pigment Red 22 (Red No. 404)

C.I. Pigment Red 48 (Red No. 405)

C.I. Pigment Red 57 (Red No. 201)

C.I. Pigment Red 57-1 (Red No. 202)

C.I. Pigment Red 166

C.I. Food Blue 2 (Blue No.1)

C.I. Basic Violet 3

C.I. Reactive Orange 16

C.I. Reactive Black 5

C.I. Reactive Blue 21

C.I. Reactive Blue 27

C.I. Reactive Blue 28

C.I. Reactive Blue 38

C.I. Reactive Red 21