

1. Reagents and Test Solutions

DEAE-Bridged Cellulose Anion-exchanger (- O·C₂H₅·N(C₂H₅)₂ -Type), Weakly Basic

Use weakly basic anion-exchanger strengthened with bridging porous cellulose and introduced diethyl-aminoethyl group.

Decarbonyl-group Methanol See Methanol, Decarbonyl-group.

Dehydrated Chloroform See Chloroform, Dehydrated.

Dehydrated Pyridine See Pyridine, Dehydrated.

Devarda's Alloy (Guaranteed)

Dextrin (C₆H₁₀O₅)_n · xH₂O (Guaranteed)

4,4'-Diaminodiphenylamine Sulfate C₁₂H₁₃N₃ · H₂SO₄ (Extra Grade)

4,4'-Diaminodiphenylamine TS Triturate well 4,4'-diaminodiphenylamine sulfate with a small quantity of ethanol, and add ethanol again. Equip with a reflux condenser, and heat on a water bath to make a saturated solution.

Diammonium Phosphate (NH₄)₂HPO₄ (Diammonium Hydrogen Phosphate, Guaranteed)

Diammonium Phosphate Buffer Weigh 150 g of diammonium phosphate, dissolve in 700 ml of water, adjust the pH to 5.5 with diluted hydrochloric acid (1 : 2), and add water to make 1,000 ml.

Diarsenic Trioxide As₂O₃ (Guaranteed)

Diarsenic Trioxide (Standard reagent) As₂O₃ (Standard reagent)

Diatomaceous Earth for Gas Chromatography Use diatomaceous earth of high quality purified for Gas Chromatography.

Diatomaceous Earth for Chromatography Use white to grayish white diatomaceous earth of high quality.

2,6-Dibromoquinonchloroimide C₆H₂Br₂ClNO [2,6-Dibromo-N-chloro-p-benzoquinonemonoimine (2,6-Dibromoquinonechloroimide), Guaranteed]

Dibutyl Hydroxytoluene See Butylated Hydroxytoluene.

2,6-Dichloroquinonechloroimide C₆H₂Cl₂NO

Melting point: 65 - 67 °C.

Clarity of ethanolic solution: Clear (0.10 g, ethanol 10 ml).

Residue on ignition: Not more than 0.2 %.

Diethylene Glycol Succinate Polyester Use diethylene glycol succinate polyester of high quality prepared for Gas Chromatography.

Digitonin C₅₆H₉₂O₂₉ (Guaranteed)

Dilute Acetic Acid See Acetic Acid, Dilute.

Dilute Hydrochloric Acid See Hydrochloric Acid, Dilute.

Dilute Methylene Blue TS See Methylene Blue TS, Dilute.

Dilute Nitric Acid See Nitric Acid, Dilute.

Dilute Sulfuric Acid See Sulfuric Acid, Dilute.

1,2-Dimethoxyethane C₄H₁₀O₂ 1,2-Dimethoxyethane occurs as a colorless transparent liquid having ether-like odor, and is very soluble in water, ethanol and solvents related hydrocarbons.

Content: 1,2-Dimethoxyethane contains not less than 99.0% of 1,2-dimethoxyethane (C₄H₁₀O₂).

Boiling point: 82 - 83 °C.

Assay: Perform Gas Chromatography on 1,2-Dimethoxyethane under the following conditions and calculate the area percentage for the main peak.

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Operating conditions

Detector: Flame ionization detector.

Column packing material

Liquid phase: 10 % of amount of support is polyethylene glycol 20M.

Support: 177- to 250- μ m of diatomaceous earth for gas chromatography.

Column tube: Glass or stainless steel tube 2 m in length and 3 - 4 mm in internal diameter.

Column temperature: Constant temperature of 70 - 80 .

Carrier gas and flow rate: Helium, constant rate of 50 ml/min.

1,2-Dimethoxyethane Containing 5 % Methanol TS Add 1,2-dimethoxyethane to 5 ml of methanol to make 100 ml. The solution is stable at least for 3 months, when store in a refrigerator.

Dimethylamine Hydrochloride $(\text{CH}_3)_2\text{NH} \cdot \text{H}_2\text{O} \cdot \text{HCl}$ Dimethylamine Hydro-chloride occurs as white, deliquescent crystals. It is very soluble in water and melts at 170 - 172 .

***p*-Dimethylaminobenzaldehyde** $(\text{CH}_3)_2\text{NC}_6\text{H}_4\text{CHO}$ (Guaranteed)

***p*-Dimethylaminobenzaldehyde TS** Weigh 125 mg of *p*-dimethylaminobenzaldehyde, dissolve in 100 ml of cold, diluted sulfuric acid (13 20), and add 0.05 ml of iron () chloride solution (1 10). Use within 7 days after preparation.

***p*-Dimethylaminobenzylidenerhodanine** $\text{C}_{12}\text{H}_{12}\text{N}_2\text{OS}_2$
[*p*-Dimethylamino-benzylidenerhodanine (5 - (4 - Dimethylaminobenzyliden) - 2 - thioxo - 4 - thiazoli dinone), Guaranteed]

***p*-Dimethylaminobenzylidenerhodanine TS** Weigh 0.02 g of *p*-dimethylamino-benzylidenerhodanine, and dissolve in acetone to make 100 ml.

Dimethylaniline $\text{C}_6\text{H}_5\text{N}(\text{CH}_3)_2$ (*N,N*-Dimethylaniline, Extra Grade)

Dimethylformamide $\text{HCON}(\text{CH}_3)_2$ (*N,N*-Dimethylformamide, Guaranteed)

Dimethylglyoxime $(\text{CH}_3)_2\text{C}_2(\text{NOH})_2$ (Guaranteed)

Dimethylsulfoxide $(\text{CH}_3)_2\text{SO}$ (Guaranteed)

Dimethylsulfoxide for Ultraviolet Absorption Spectrophotometry $(\text{CH}_3)_2\text{SO}$

Dimethylsulfoxide for Ultraviolet Absorption Spectrophotometry occurs as colorless, transparent crystals or is a colorless, transparent liquid. It is strongly hygroscopic and has a characteristic odor. The water content is not more than 0.1% and congealing point is 18.3 . Saturate nitrogen, and determine immediately the absorbance, using distilled water as the reference. The absorbance is not more than 0.20 at 270 nm, not more than 0.09 at 275 nm, not more than 0.06 at 280 nm, and not more than 0.015 at 300 nm. No characteristic absorbance is observed at 260 - 350 nm.

3,5-Dinitrobenzoyl Chloride $(\text{NO}_2)_2\text{C}_6\text{H}_3\text{COCl}$ (Guaranteed)

2,4-Dinitrochlorobenzene $\text{C}_6\text{H}_3(\text{NO}_2)_2\text{Cl}$ (Guaranteed)

2,4-Dinitrophenylhydrazine $\text{C}_6\text{H}_6\text{N}_4\text{O}_4$ (Guaranteed)

2,4-Dinitrophenylhydrazine Hydrochloride TS Transfer 10 ml of hydrochloric acid into a 100 ml Erlenmeyer flask, add 5 g of 2,4-dinitrophenylhydrazine, Shake gently until free base of the reagent (red color) changes to hydrochloride (yellow color). Add 100 ml of ethanol, heat and dissolve on a water bath. Cool and

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crystallize at room temperature. Filter and wash with ether. Dry at room temperature, store in a desiccator. Use it as 2,4-Dinitrophenylhydrazine Hydrochloride Reagent. This reagent gradually changes from hydrochloride to free base, this free base is removed by rinsing with 1,2-dimethoxyethane. Dissolve 0.5 g of 2,4-dinitrophenylhydrazine hydrochloride reagent into 15 ml of 1,2-dimethoxyethane containing 5% methanol, store in refrigerator.

Dioxane $C_4H_8O_2$ See 1,4-Dioxane.

1,4-Dioxane $C_4H_8O_2$ (Guaranteed)

Diphenylamine $(C_6H_5)_2NH$ (Guaranteed)

Diphenylamine TS Weigh 1 g of diphenylamine, and dissolve in 100 ml of sulfuric acid. Diphenylamine TS is colorless.

Dipotassium Phosphate K_2HPO_4 (Dipotassium Hydrogen Phosphate, Guaranteed)

2,2'-Dipyridyl $(C_5H_4N)_2$ [2,2'-Bipyridyl (2,2'-Dipyridyl), Guaranteed]

Disodium Chromotopate See Chromotropic Acid

Disodium Ethylenediaminetetraacetate $C_{10}H_{14}N_2Na_2O_8 \cdot 2H_2O$ (Guaranteed)

Disodium Ethylenediaminetetraacetate TS Dissolve 37.2 g of disodium ethylenediaminetetraacetate in water, and make it to 1000 ml.

Disodium 5'-Guanylate $C_{10}H_{12}N_5Na_2O_8P \cdot 4 - 7H_2O$ "Disodium 5'- Guanylate"

Disodium 5'-Inosinate $C_{10}H_{11}N_4Na_2O_8P \cdot 6 - 8H_2O$ "Disodium 5'- Inosinate"

Disodium Phosphate $Na_2HPO_4 \cdot 12H_2O$ (Disodium Hydrogen Phosphate, Dodecahydrate, Guaranteed)

Disodium Phosphate, Anhydrous Na_2HPO_4 [Disodium Hydrogen Phosphate (Anhydrous), Guaranteed]

Disodium Phosphate, Anhydrous, for pH Determination Na_2HPO_4 [Disodium Hydrogen Phosphate (Anhydrous), for pH determination]

Disodium Salt of 4,4'-(Diazo-amino)-dibenzenesulfonic Acid $C_{12}H_9N_3Na_2O_6S_2$
Disodium Salt of 4,4'-(Diazo-amino)-dibenzenesulfonic Acid occurs as a white to whitish powder.

Specific absorbance: $E_{1\%}^{1\text{cm}}$ (absorption maximum near the 358 nm) = Not less than 677.

Weigh 10.0 mg of Disodium Salt of 4,4'-(Diazo-amino)-dibenzenesulfonic Acid, previously dried for 24 hours in a desiccator under a reduced pressure, dissolve in ammonium acetate solution (3 : 2,000) to make exactly 100 ml, and use this solution as solution A. Measure exactly 10 ml of solution A, and add ammonium acetate solution (3 : 2,000) to make exactly 100 ml. Measure an absorption of this solution. The solution exhibits an absorption maximum at each of the wavelength of 240 nm and 358 nm.

Purity: Other aromatic compounds Measure exactly 10 ml of solution A, and add ammonium acetate solution (3 : 2,000) to make exactly 100 ml. Measure 20 μ l of this solution, and perform Liquid Chromatography under the operating conditions specified in Purity (6) for Food Yellow No. 4 in the Monographs, JSFA- . Only one peak is observed.

Disodium Salt of 6-Hydroxy-5-((2-methoxy-5-methyl-4-sulfophenyl)azo)-8-

(2-methoxy-5-methyl-4-sulfophenoxy)-2-naphthalenesulfonic Acid $C_{26}H_{22}N_2Na_2O_{13}S_3$
Disodium Salt of 6-Hydroxy-5-((2-methoxy-5-methyl-4-sulfophenyl) azo)-8-(2

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-methoxy-5-methyl-4-sulfophenoxy)-2-naphthalenesulfonic Acid occurs as a reddish brown powder.

Specific absorbance: $E_{1\text{ cm}}^{1\%}$ (absorption maximum near the 517nm) = Not less than 500.

Weigh 10.0 mg of Disodium Salt of 6-Hydroxy-5-((2-methoxy-5-methyl-4-sulfophenyl)azo)-8-(2-methoxy-5-methyl-4-sulfophenoxy)-2-naphthalenesulfonic Acid, previously dried for 24 hours in a desiccator under a reduced pressure, dissolve in ammonium acetate solution (3 2,000) to make exactly 100 ml, and use this solution as solution A. Measure exactly 10 ml of solution A, and add ammonium acetate solution (3 2,000) to make exactly 100 ml. The solution exhibits an absorption maximum at a wavelength of 515 nm to 519 nm.

Purity: Other coloring matter Measure exactly 1.0 ml of solution A, and add ammonium acetate solution (7.7 1,000) to make exactly 100 ml. Measure 20 μl of this solution, and perform Liquid Chromatography under the operating conditions specified in Purity (6) for Food Red No. 40 specified in the Monographs, JSFA-. Only one peak of disodium salt of 6-hydroxy-5-((2-methoxy-5-methyl-4-sulfophenyl)azo)-8-(2-methoxy-5-methyl-4-sulfophenoxy)-2-naphthalenesulfonic acid is observed.

Disodium Salt of 3-Hydroxy-2,7-naphthalene-disulfonic Acid $\text{C}_{10}\text{H}_6\text{Na}_2\text{O}_7\text{S}_2$
Disodium Salt of 3-Hydroxy-2,7-naphthalenedisulfonic Acid occurs as a white to whitish powder.

Specific absorbance: $E_{1\text{ cm}}^{1\%}$ (absorption maximum near the 281 nm) = Not less than 126.

Weigh 10.0 mg of Disodium Salt of 3-Hydroxy-2,7-naphthalenedisulfonic Acid, previously dried for 24 hours in a vacuum desiccator, add ammonium acetate solution (3 2,000) and dissolve to make exactly 100 ml. Use this solution as solution A. Exactly measure 10 ml of solution A, add ammonium acetate solution (3 2,000) to make exactly 100 ml. Measure the absorption of this solution. The solution exhibits an absorption maximum at each of the wavelengths of 236 nm, 273 nm, 281 nm, and 340 nm.

Purity: Other aromatic compounds Exactly measure 10 ml of solution A, add ammonium acetate solution (3 2,000) to make exactly 100 ml. Measure 20 μl of this solution, perform Liquid Chromatography using the operating conditions directed under Purity (6) for Food Red No.2 in the Monographs, JSFA-. Only one peak is observed.

Disodium Salt of 7-Hydroxy-1,3-naphthalene-disulfonic Acid $\text{C}_{10}\text{H}_6\text{Na}_2\text{O}_7\text{S}_2$

Disodium Salt of 7-Hydroxy-1,3-naphthalenedisulfonic Acid occurs as a white to whitish powder.

Specific absorbance: $E_{1\text{ cm}}^{1\%}$ (absorption maximum near the 288 nm) = Not less than 150

Weigh 10.0 mg of Disodium Salt of 7-Hydroxy-1,3-naphthalenedisulfonic Acid, previously dried for 24 hours in a vacuum desiccator, add ammonium acetate

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solution (3 2,000) and dissolve to make exactly 100 ml. Use this solution as solution A. Exactly measure 10 ml of solution A, add ammonium acetate solution (3 2,000) to make exactly 100 ml. Measure the adsorption of this solution. The solution exhibits an absorption maximum at each of the wavelengths of 237 nm, 288 nm and 336 nm.

Purity: Other aromatic compounds Exactly measure 10 ml of solution A, add ammonium acetate solution (3 2,000) to make exactly 100 ml. Measure 20 μ l of this solution, perform Liquid Chromatography using the operating conditions directed in Purity (6) for Food Red No.2 in the Monographs, JSFA-. Only one peak is observed.

Disodium Salt of 6,6'-Oxybis (2-naphthalenesulfonic acid) $C_{20}H_{12}Na_2O_7S_2$

Disodium Salt of 6,6'-Oxybis (2-naphthalenesulfonic acid) occurs as a whitish powder.

Specific absorbance: $E_{1\text{ cm}}^{1\%}$ (absorption maximum near the 240 nm) = Not less than 2,020.

Weigh 10.0 mg of Disodium Salt of 6,6'-Oxybis (2-naphthalenesulfonic acid), previously dried for 24 hours in a desiccator under a reduced pressure, dissolve in ammonium acetate solution (3 2,000) to make exactly 100 ml, and use this solution as solution A. Measure exactly 10 ml of solution A, and add ammonium acetate solution (3 2,000) to make exactly 100 ml. The solution exhibits an absorption maximum at each of the wavelengths of 220 nm and 240 nm.

Purity: Other aromatic compounds Measure exactly 1.0 ml of solution A, and add ammonium acetate solution (7.7 1,000) to make exactly 100 ml. Measure 20 μ l of this solution, and perform Liquid Chromatography under the operating conditions specified in Purity (8) for Food Red No. 40 in the Monographs, JSFA-. Only one peak of disodium salt of 6,6'-oxybis (2-naphthalenesulfonic acid) is observed.

Dissolved Acetylene C_2H_2 (Dissolved Acetylene)

Distilled Water Use Purified Water specified under the Japanese Pharmacopoeia.

Dithizone $C_{13}H_{12}N_4S$ [Dithizone (Diphenylthiocarbazone), Guaranteed]

Dithizone TS for Zinc Weigh 0.01 g of dithizone, and dissolve in 100 ml of chloroform. Store in a colored bottle with a ground-glass stopper.

Dragendorff Reagent

Solution 1: Weigh 0.85 g of basic bismuth nitrate, and dissolve in 10 ml of acetic acid and 40 ml of water.

Solution 2: Weigh 8 g of potassium iodide, and dissolve in 20 ml of water.

Mix 5 ml of Solution 1, 5 ml of Solution 2, 20 ml of acetic acid, and 100 ml of water before use.