PATENT BLUE V

Prepared at the 69th JECFA (2008), published in FAO JECFA Monographs 5 (2008), superseding specifications prepared at the 31st JECFA (1987), published in the combined Compendium of Food Additive Specifications, FAO JECFA Monographs 1 (2005). No ADI could be allocated at the 26th JECFA (1982).

SYNONYMS CI Food Blue 5, Patent Blue 5; CI (1975) No. 42051; INS No. 131

DEFINITION Patent Blue V consists essentially of the calcium or sodium salt of 2-[(4-diethylaminophenyl)(4-diethylimino-2,5-cyclohexadien-1-ylidene)methyl]-4-hydroxy-1,5-benzenedisulfonate and subsidiary colouring matters. Water, sodium chloride, sodium sulfate, calcium chloride, and calcium sulfate can be present as the principal uncoloured components.

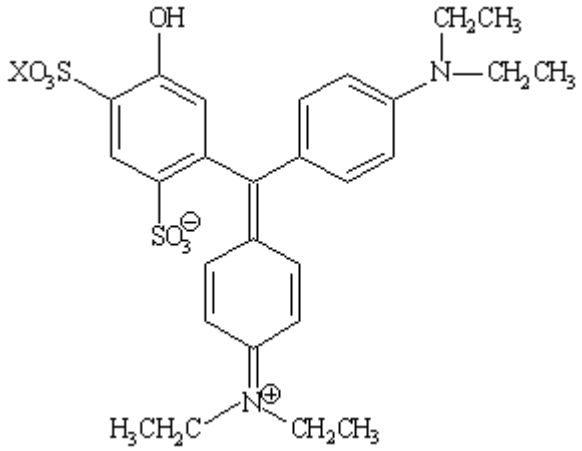
Patent Blue V may be converted to the corresponding aluminium lake, in which case only the *General Specifications for Aluminium Lakes of Colouring Matters* applies.

Chemical names: Calcium or sodium salt of 2-[(4-diethylaminophenyl)(4-diethylimino-2,5-cyclohexadien-1-ylidene)methyl]-4-hydroxy-1,5-benzene-disulfonate; Calcium or sodium salt of [4-[*alpha*-(4-diethyl-aminophenyl)-5-hydroxy-2,4-disulfonatophenylmethylidene]-2,5-cyclohexadien-1-ylidene] diethylammonium hydroxide inner salt

C.A.S. number: 3536-49-0

Chemical formula: Calcium salt: $C_{27}H_{31}N_2O_7S_2{}^1\!/_2Ca$
Sodium salt: $C_{27}H_{31}N_2O_7S_2Na$

Structural formula



where
X = ½Ca for the calcium salt
X = Na for the sodium salt

Formula weight	½Calcium salt: 579.14 Sodium salt: 582.15
Assay	Not less than 85% total colouring matter

DESCRIPTION

Blue powder or granules

FUNCTIONAL USES

Colour

CHARACTERISTICS

IDENTIFICATION

Solubility (Vol. 4)	Soluble in water; slightly soluble in ethanol
Colouring matters, Identification (Vol. 4)	Passes test

PURITY

Water content (Loss on drying) (Vol. 4)	Not more than 15% together with chloride and sulfate calculated as sodium salts
Water-insoluble matter (Vol. 4)	Not more than 0.5%
Lead (Vol. 4)	Not more than 2 mg/kg Determine using an AAS/ICP-AES technique appropriate to the specified level. The selection of sample size and method of sample preparation may be based on the principles of the methods described in Volume 4 (under “General Methods, Metallic Impurities”).
Chromium (Vol. 4)	Not more than 50 mg/kg Determine using an AAS/ICP-AES technique appropriate to the specified level. The selection of sample size and method of sample preparation may be based on the principles of the methods described in Volume 4 (under “General Methods, Metallic Impurities”)
Subsidiary colouring matter content (Vol. 4)	Not more than 2% Use the following conditions: Chromatography solvent: n-butanol:water:ethanol:ammonia (s.g. 0.880) (600:264:135:6) Height of ascent of solvent front: approximately 17 cm
Organic compounds other than colouring matters	Not more than 0.5% (Sum of 3-hydroxybenzaldehyde, 3-hydroxybenzoic acid, 3-hydroxy-4-sulfonatobenzoic acid and *N,N*-diethylaminobenzenesulfonic acids) See description under TESTS

Leuco base (Vol. 4)

Not more than 4%
Proceed as directed in Volume 4 using the following parameters:
- Sample: 110 mg
- Ratio of the formula weight of the colouring matter to the formula weight of its leuco base:
  Sodium salt: 582.15/606.66 = 0.95960
  ½Calcium salt: 579.14/600.76 = 0.96401
- Absorptivity: 0.200 l/(mg·cm) at 638 nm

Unsulfonated primary aromatic amines (Vol. 4)

Not more than 0.01%, calculated as aniline

Ether-extractable matter (Vol. 4)

Not more than 0.2%

TESTS

PURITY TESTS

Organic compounds other than colouring matters (Vol. 4)

Proceed as directed under *Determination by High Performance Liquid Chromatography* using the following conditions:
Instrument: High Performance Liquid Chromatograph fitted with a gradient elution accessory

Detector: A UV detector monitored at 254 nm
Column: 250 x 4 mm (Kartusche). LiChrosorb RP 18, 7 µm or equivalent.
Mobile phase:
(A) Acetate buffer pH 4.6: water (10% w/v) - prepared using 1 M sodium hydroxide, 1 M acetic acid and water (5:10:35)
(B) Acetonitrile

Gradient

Min	*% (A)*	*% (B)*	*Flow rate (ml/min)*
0	85	15	1
12	85	15	1
25	20	80	2
28	20	80	2
40	85	15	1

METHOD OF ASSAY

Proceed as directed under *Colouring Matters Content by Titration with Titanous Chloride* (Volume 4), under *Food Colours, Colouring Matters*), using the following:
Weight of sample: 1.3-1.4 g
Buffer: 15 g sodium hydrogen tartrate
Weight (*D*) of colouring matters equivalent to 1.00 ml of 0.1 N $TiCl_3$:
28.98 mg of the calcium salt
29.13 mg of the sodium salt.