



ALLEGATO 9

IN COLLABORAZIONE CON




S G M Ingegneria S.r.l.

SULPHORHODAMINE G

Chemical Nature :

- Chemical Name : hydrogen-9-(2,4-disulfonatophenyl)-3,6-bis(ethylamino)-2,7-dimethylxanthylium, monosodium salt
- Synonym : sulphorhodamine G / amidorhodamine G
- Chemical Formula : $C_{25}H_{26}N_2O_7S_2 \cdot Na$
- Class : xanthen
- Molar Mass : 553,61 g/mol

Nomenclature :

- COLOR INDEX : Acid Red 50
 - Constitution N° : 45220
 - EINECS N° : 227-528-6
 - CAS N° : 5873-16-5
 - Dye allowed for colouring cosmetic products : N° INCI : C.I. 45220
-  Only use in rinse-off products.

Main Specifications:

- **Appearance** : dark red powder
- **Colour in solution, at different concentrations** :
 - at 10 g/l : unclear solution, deep bluish red
 - at 1 g/l : unclear solution, dull reddish orange, with yellow-orange fluorescent light
 - at 0,1 g/l : slightly unclear solution, bright blue pink, yellow-orange fluorescent
 - at 0,01 g/l : clear solution, light blue pink, yellow-orange fluorescent
- **Dominant wave length (λ_{max})** : 500 nm
- **Absorption** : 1.738
- **Humidity rate** : 3 à 4 % max.
- **Insoluble** : 0,2 % max.
- **Contents** :

Chlorides :	< 1 000 ppm	Sulphates :	< 1 000 ppm
Calcium :	< 200 ppm	Chromium :	nothing
Magnesium :	< 200 ppm	Copper :	nothing
Iron :	< 50 ppm		
- **Solubility in water** :
 - approximayely 5 g/l at ambient temperature
 - approximately 10 g/l at 90°C
- **pH** : approximately 7-8 (aqueous dilution at 0.1 %)
- **Conductivity** : 3,5 at 4,5 ms/cm
- **Solubility in solvents** :
Very slightly soluble in alcohols, glycols and ketones.

SULPHORHODAMINE G

- **Light fastness , on textile :**
(*scale of Blue, from 1 to 8*)
 - Pastel shade: 2
 - Medium shade : 3
 - Dark shade : 3-4
- **Alkali fastness : 3** (*scale from 1 to 5*)
- **Shelf life :** 5 years minimum, in a hermetically sealed packaging, keep away from light, moisture, frost and heat.

Main application areas :

- Hydrology (flow measurement, location of leaks in pipelines...)
- Paper
- Inks
- Colouring of cosmetic products (*only in rinse-off products!*)
- Textile : dyeing and printing (silk, wool, viscose, polyamide)
- Leather and skins, feathers...

Date : 11 May 2016

FLUORESCEINE

SN CONC.

Chemical nature:

- Chemical name: 2 (3-oxo-6-oxidoanthène-9-yl) benzoate of disodium
- Chemical formula: $C_{20}H_{10}O_5Na_2$
- Classify: xanthene; acid dye (anion)
- Another denomination: pitchblende
- Mass Molaire: 376,28 g/mol

Nomenclature:

- COLOR INDEX : Acid Yellow 73
- Constitution N°: 45350
- EINECS N°: 208-253-0
- CAS N°: 518-47-8
- In compliance with the standard toys 71-3 (heavy metal content)
- Dye approved for very produced cosmetic (field of application 1): N° INCI: Ci 45350
Restriction: the amount of dye should not exceed 6% of the finished product (legislation EC)
- The USA: D&C Yellow N°8

Main Characteristics:

- **Aspect:** powder brown “rusts”, hygroscopic (= fears moisture → to close again packing well after each use).
- **Apparent Bulk density:** 0,45 g/cm³
- **Content while colouring:** 75% minimum
- **Color in aqueous solution, with 25 mg/l:** yellow solution fluo, green fluorescence
The “ fluorescent” effect is a function of the concentration while colouring; however, beyond of a certain amount, this fluorescence tends to disappear. A proportioning from approximately 5 to 10 mg/l makes it possible to obtain a satisfactory fluorescence.
This dye behaves like a “duplex system”: it absorbs solar energy until approximately 5.000 Angströms, and re-emits in a narrow frequency band, around 5.300 Angströms, enough close to the maximum of sensitivity of the human eye. More precisely, Fluorescein consists of a molecule able to re-emit a green fluorescent light (to 525 Nm) when it is excited by a blue light (to 485 Nm).
- **Dominant Wavelength:** approximately 540 Nm
- **Solubility in water:** approximately 700 g/l with 20°C
- **Rate of insoluble in water:** 0,5% maximum
- **pH (with 20°C):** approximately 7-9, in aqueous solution with 10 g/l
- **Solubility in solvents:** Methanol: slightly soluble
Ethanol: approximately 10 g/l
Acetone: very slightly soluble
- **Solidity at the bases:** enough good

FLUORESCEINE SN CONC.

Pure ammonia: yellow solution sharp fluorescent, stable 1 minimum month

Diluted ammonia (pH = 13): yellow solution sharp fluorescent, stable 1 minimum month

Pure soda: yellow rosy, non fluorescent solution; becomes pink-greyish, in a few hours

Weld diluted (pH = 13): yellow solution sharp fluorescent, stable 1 minimum month

- **Solidity with the light:** colouring disappears rather quickly when the solution is exposed to the light, and, in particular, if the pH is slightly acid.

- **Discolouration of solutions:**

In oxidizing medium: the bleach addition (35 to 40 ml) makes it possible to fade a solution with 0,1 g/l of dye.

In reducing medium: the soda hydrosulphite addition (up to 20 g/l) does not make it possible to completely fade a solution with 0,1 g/l of dye.

- **Temperature of decomposition:** > 350°C

- **Melting point:** > 250°C

- **Content of organic compounds birds (with 150°C) :** 3.2 %

- **Content of heavy metals:**

Arsenic: < 1 ppm

Lead: < 1 ppm

Selenium: < 1 ppm

Cadmium: < 1 ppm

Chromium plate: < 7 ppm

Zinc: < 10 ppm

Barium: < 17 ppm

Antimony: < 20 ppm

Mercury: < 1 ppm

- **Content of aromatic amines:** < 200 ppm

- **Time limitation:** 5 years, in packing hermetically closed, with the shelter of the light, moisture, freezing and heat.

Main application fields:

- **Hydrology:** location of the rivers or escape in the drains, measurement of the discharge of river, location of the marine currents... (*approximately 10-15 mg/l*)

Fluorescein is a tracer of reference, which can be used in weak concentration, with an adequate measuring apparatus of precision; in revenge, this dye is not easily usable out of acid water, because of the loss of fluorescence, measured by a fluorometer.

By elsewhere, this tracer being sensitive to the luminous exposure, it thus should be maintained out of the light, in order to avoid any degradation.

Notes: • *No ecotoxicity was highlighted starting from the tests carried out on various fish; the results available in the literature on the daphnids, confirm these conclusions.*

This tracer can be employed in subsoil waters without particular precaution.

• *Not to introduce close to drinking water collectings.*

- **Colouring of fountains, basins...** (*Proportioning: 1 to 2 G /10 m³, for a depth of 1 m*)

- **Colouring of cosmetic products** (soaps...); the quantity of dye should not exceed 6% of the finished product (legislation EC).

- **Colouring of chemicals, upkeeping product...**

- **Special effects,** in UV or daylight.

Note: *Fluorescein does not stain the marble, nor the concrete or the materials like the porcelain.*

Traces of this dye are eliminated easily using chlorinated water or from an alkaline commercial detergent.

Date: May 12th, 2011

AZURANT OPTIQUE

CBS-X

Chemical Nature :

- Chemical name : 2,2'-([1,1'-biphenyl]-4,4'-diyldivinylène) bis (benzene) of Disodium
- Chemical Formula : $C_{28}H_{22}O_6S_2 \cdot 2Na$
- Chemical Class : anionic dye, derivate of a distyryl-biphenyl compound
- Molar Mass : 562,56 g/mol

Nomenclature :

- COLOR INDEX : Fluorescent Brightener 351
- Constitution N° : -
- EINECS N° : 248-421-0
- CAS N° : 27344-41-8

Main Specifications :

- **Appearance** : fine powder, pale yellow, with a slight characteristic odor
- **Coulour in solution** : colorless in daylight, blue fluorescence under UV light
- **Density (in bulk, at 20°C)** : approximately 550 - 670 g/l
- **Humidity** : 2 % max
- **Non volatile matter** : 99,5 % min
- **Solubility in water** :
 - approximately 25 g/l at 30°C
 - approximately 250 g/l at 100°C
- **pH (at 20°C)** : approximately 7-9 in aqueous dispersion at 1 g/l
- **Decomposition temperature** : > 300°C
- **Ignition temperature** : > 500°C
- **Shelf life** : 5 years minimum, in a hermetically sealed packaging, keep away from light, moisture, frost and heat.

Main application areas:

- Detergents (0,02 à 0,06 %), soaps (0,01 à 0,05 %)...
- Textile : brightener for cotton, nylon, wool
- Paper : bleach for papers / cartons

(including packaging material which is intended to contact with food- *note of 13 october 1998*)