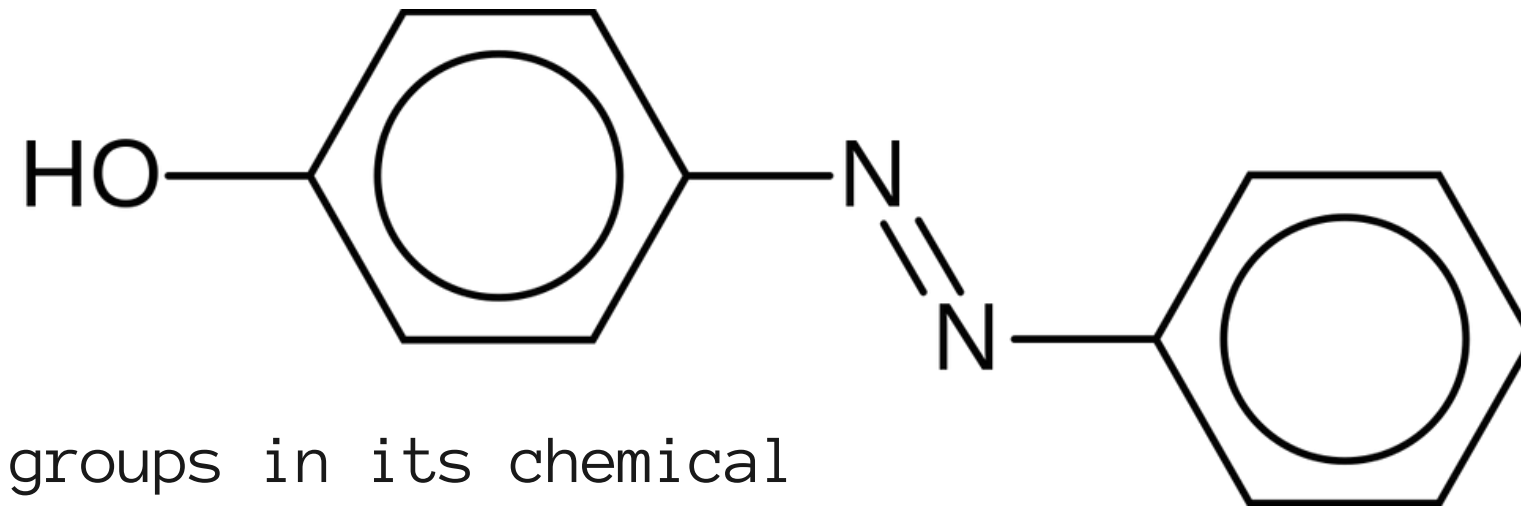


- ▶ The dyes containing insoluble azo group (-N=N-)
- ▶ These dyes are not found in readymade form. Azoic dyes are produced by a reaction between two components.

The components are: 1. Coupling Compound (Naphthol) 2. Di-azo – compound or diazo base or diazo salt.

AZOIC DYES

PROPERTIES



- These dye stuffs always contain Azo groups in its chemical structure.
- Lightfastness property is admirable.
- The brightness of shade is admirable.
- It is directly insoluble in water.
- These dyestuffs are always used in dyeing cellulosic material.
- Here dyeing operation is completed by two bath arrangement. One is called impregnation bath and another is called developing bath.
- Suitable for lighter shade dyeing
- This dye stuff is called developed dye due to the formation of dye in fiber during dyeing process.
- Addition of salt increases the substantivity.

REACTION OF AZOIC DYES

▶ NAPHTHOLATION

are insoluble in water and they are converted into water-soluble compound by treating with alkali

▶ DIAZOTIZATION

a base containing amino group reacts with the NaNO_2 (Sodium Nitrite) to form a solution of diazonium chloride of that base in presence of excess HCL at -50°C

▶ COUPLING/DEVELOPING

The impregnated material is treated in a bath containing diazonium solution to carry out to coupling and thus color is produced inside the fabric. The pH maintaining is important.

Function Of Different Chemicals Used In Napthol Dyeing

Caustic Soda:

- Soluble the dye material.
- Produce alkali medium.

T.R. oil:

- Used as softening agent.
- Used as dispersing agent.

HCHO:

- Ensure the actual level dyeing properties.
- For proper dyeing.

Salt:

- To increase the substantivity of the azo color in textile materials.

AZOIC DYES IN PRINTING

▶ PRINTING PROCESS

The naphtholated fabric is prepared then it is printed with base printing paste by block and screen printing method.

AFTER TREATMENT

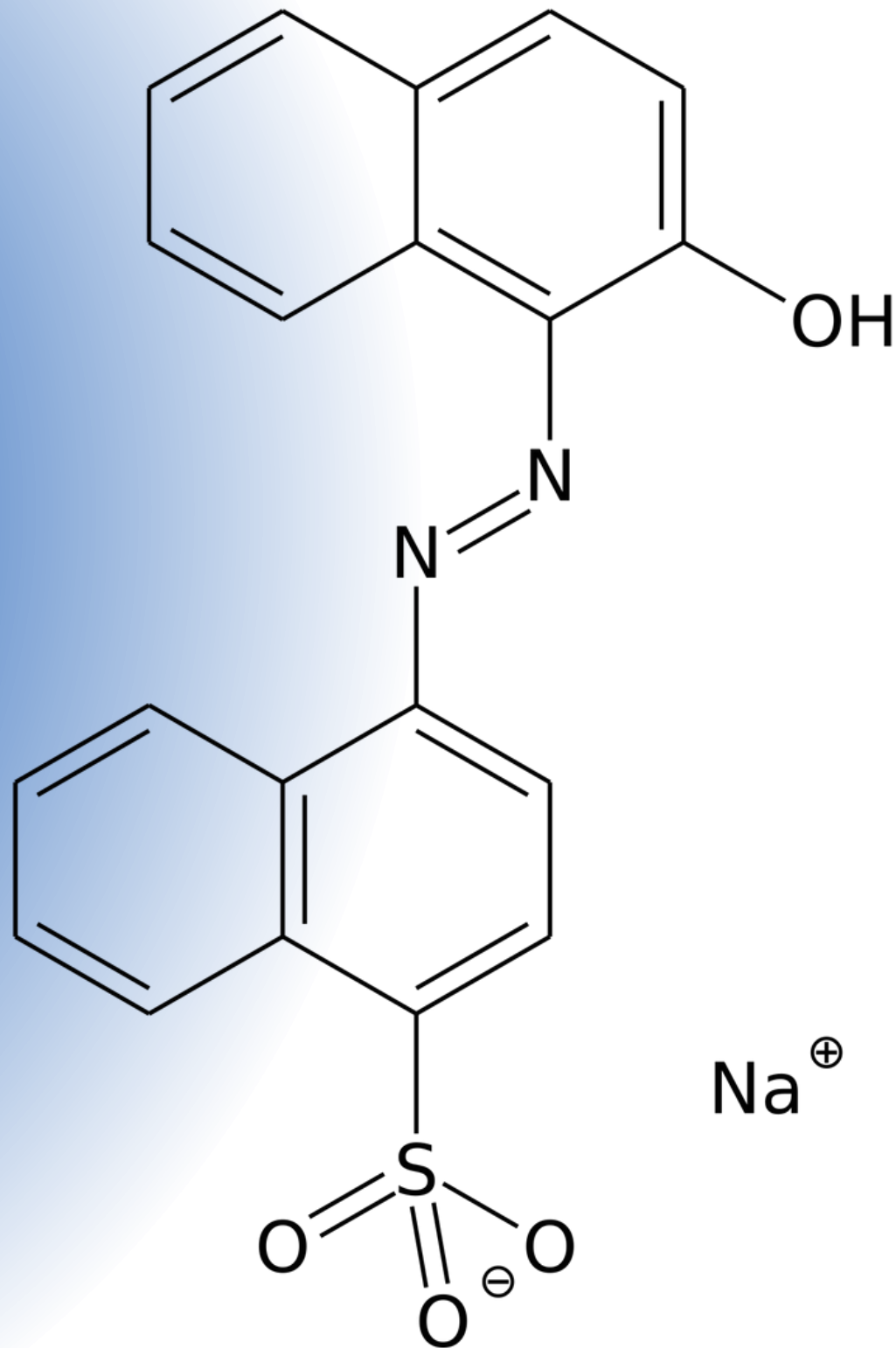
After printing the printed fabric is dried for 5-10 minutes in a dryer.

- If the naphtholation process is not so sufficient. Then the printing becomes uneven

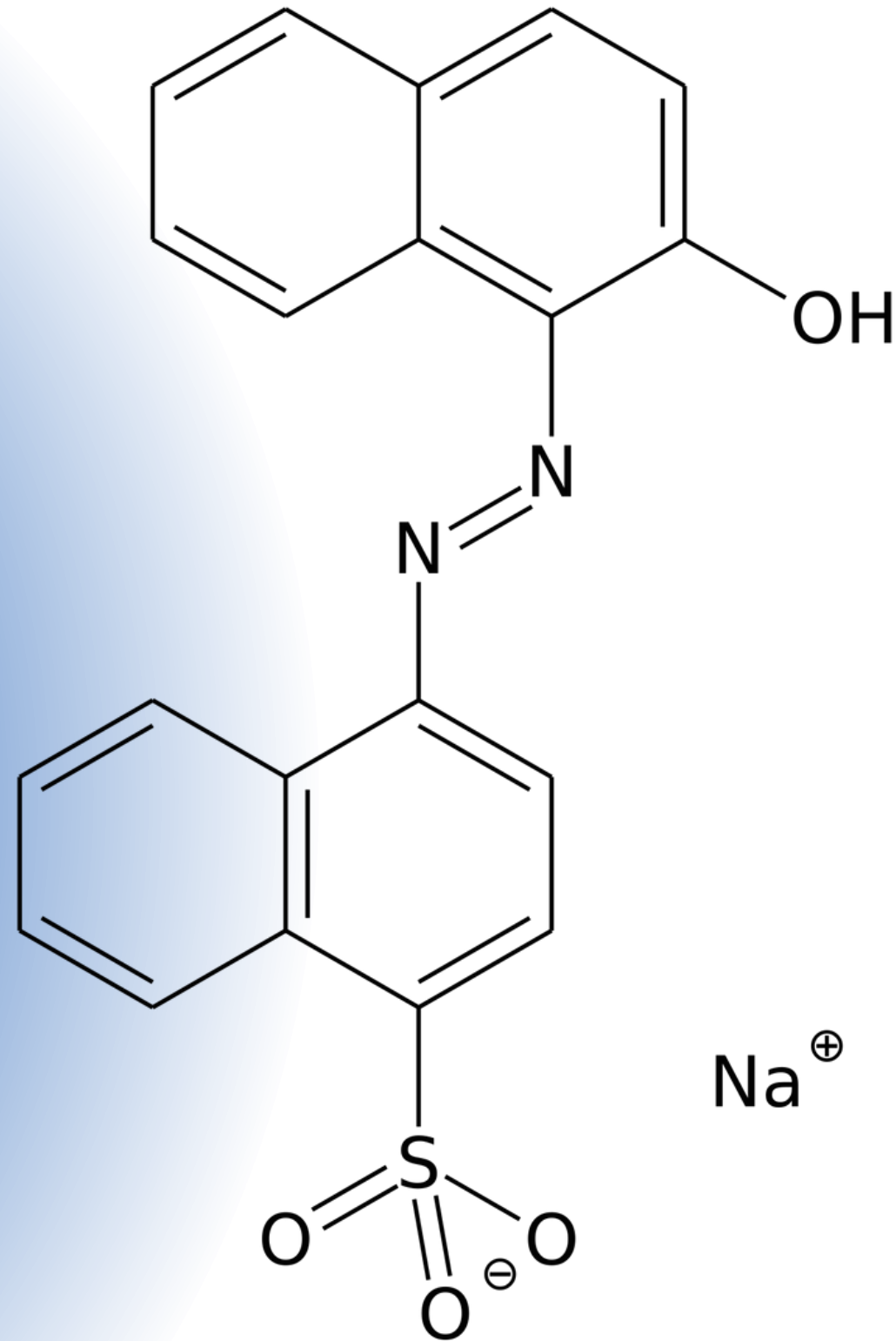
Trade Name	Manufacturer
Napthol	BASF
Branthol	ICI
Ciba Napthol	CIBA
Igra Napthol	GEIGA
Nacco – thol	NACCO

ACID DYES

▶ a type of dye that is applied from an acidic solution.

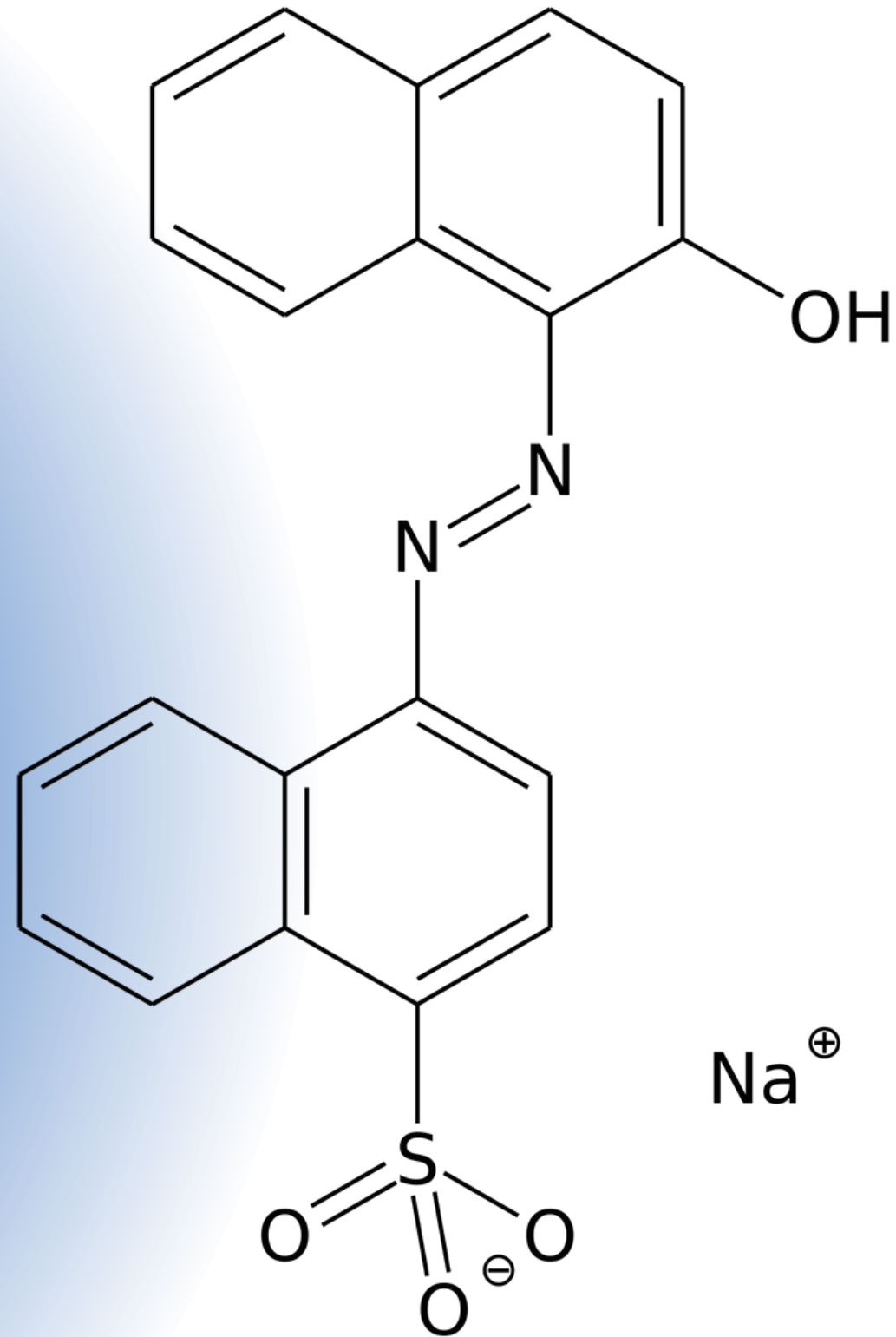


- ▶ easy to apply, have a wide range of colors
- ▶ In textiles, acid dyes are effective on protein fibers—particularly animal hair fibers such as wool, alpaca, and mohair. They are also useful for dyeing silk. They are effective on nylon but not on most other synthetic fibers.



- ▶ They are normally sold as the sodium salt, therefore they are in the form of anions in solution.
- ▶ Acid dyes are thought to attach to fibers by ionic bonds, hydrogen bonds, and Van der Waals forces.

ACID DYES



wash fastness is poor, though
light fastness is quite good

Acid generates cation on fibre
and temperature helps to
substitute negative part of acid
with anionic dye molecules.

ACID DYES

STRUCTURES

▶ Anthraquinone

Many acid dyes are synthesized from chemical intermediates which form anthraquinone-like structures as their final state. Many blue dyes have this structure as their basic shape. The structure predominates in the **leveling** class of acid dye.

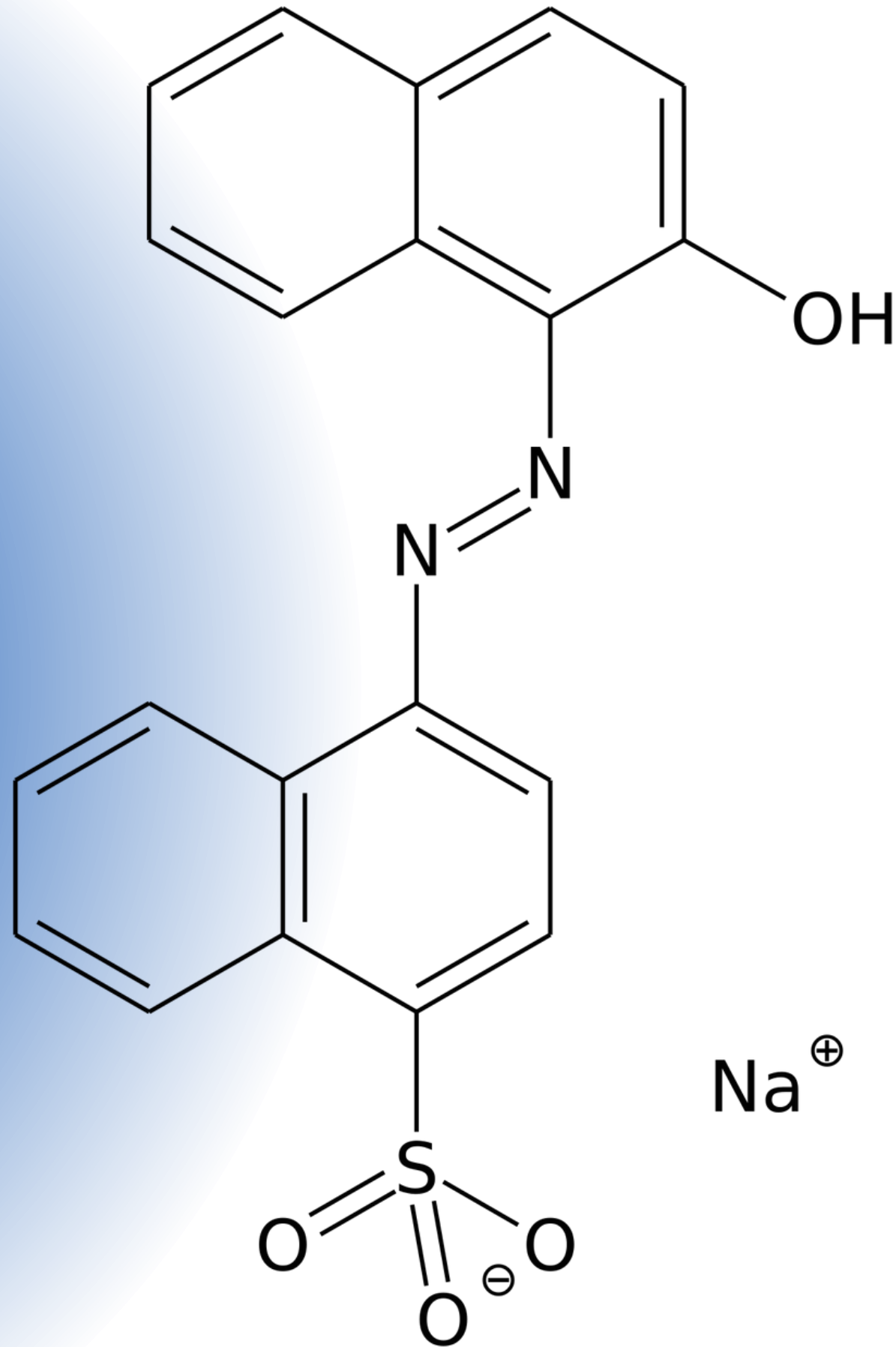
▶ Azo dyes:

The structure of azo dyes is based on azobenzene (Ph-N=N-Ph). Although azo dyes are a separate class of dyestuff, mainly used in the dyeing of cotton fibers, many acid dyes have a similar structure. Most are red in color.

▶ Triphenylmethane type:

Acid dyes having structures related to triphenylmethane predominate in the **milling** class of dyes. There are many yellow and green dyes commercially applied to fibers that are related to triphenylmethane.

ACID DYES



- ▶ the dyes are divided into three categories according to their levelling and fastness properties, called levelling, milling and super milling dyes.

CLASSES OF ACID DYES

LEVELING

They have the highest level dyeing properties and are quite combinable in trichromatic shades. Their relatively small molecules allow high migration before fixation. However, they have low wet fastness and are normally not suited for apparel fabric.

MILING ACID DYES

They have medium to high wet fastness, and some (in pale shades) have poor light fastness. These dyes are generally not combinable.

SUPER MILING ACID

More recent chemistry combined transition metals with dye precursors to produce metal complex acid dyes with the highest light fastness and wet fastness. These dyes are also very economical. They, however, produce duller shades.



DYING WITH ACID DYE

applied from the acidic bath, are anionic and soluble in water; applied on wool, silk and nylon when ionic bond is established between the protonated amine group of fibre and acid group of dye.



Two bath of individual recipe is used for dyeing with azo dyes.

- Impregnation Bath.
- Developing Bath.

Impregnation Bath (1st bath)

Recipe:

Dye Stuff → 3% (According to the wt of the material)

NaOH → 2%

T.R. oil → 2%

Hot water → 3 times

Cold water → 7 times

HCHO → 1.5%

Temperature → 40°C - 50°C

Time → For a few minutes (2 - 3)

Developing Bath (2nd bath)

Recipe

Salt Bath

Fast salt → 6%

Hot water (30°C - 40°C) → 2 times

Cold water → 8 times

NaCl → 2% - 3%

Time → 2 - 3 minutes

Base Bath

Fast base → 3%

HCl → 2.5% - 3%

NaNO₂ → 1.5%

Cold water → 10 times

Temperature → 0°C - 5°C

Time → 15 (2 - 3) minutes

Procedure

Dissolve NaOH in small quantity of hot water with Naphthol & T.R. oil in a bath and make a paste. Then add slowly in it, the rest hot water and stir (mix) constantly. After dissolving color perfectly and above mentioned cold water and finally the solution of Naphthol is thus obtained, this is cooled to 50°C if necessary, HCHO may be added in the impregnated bath. Now the bath is ready for steeping textile goods for a few minutes (In this bath, any naphtholated goods, excepting the naphthol AS - G will look yellow).

In the developing bath salt is dissolved with hot water and then cold water added in the bath. Finally add NaCl in the developing bath. Now treating the above naphtholated or impregnated goods for 2 - 3 minutes in this bath. It will be noted that the color will develop the goods magically.

Then squeeze the goods and boiling it in a soap bath followed by washing & drying. Now steep the textile goods for a while after developing a bath contains 1.5% of HCl in times of water. It is done only for neutralization of goods. Finally 3% soap and 1.5% soda is taken in a bath containing 15 times and treat the goods for a few minutes and wash the goods in fresh plain water. Then squeeze and dry. In this way, dyeing procedure is completed