

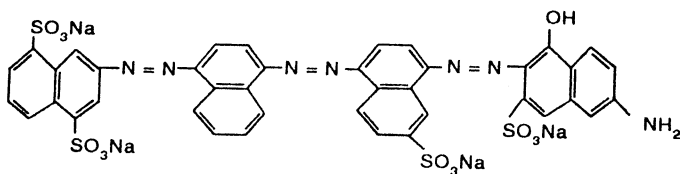
## NOTE

## Synthesis of Some Trisazo Pyrazolone Acid Dyes and Their Application on Wool and Nylon

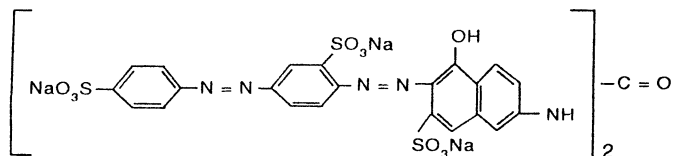
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Monoazo pyrazolone dyes are very common but trisazo pyrazolone dyes with arylazo group in position-4 and second arylazo group at position-4 of phenyl nucleus and third arylazo group at position-7 of naphthyl nucleus of H or  $\gamma$  acid are not available. Firstly aryldiazonium chloride is coupled in alkaline medium with 1-phenyl-3-methyl-5-pyrazolone or 1(2'-chlorophenyl)-3-methyl-5-pyrazolone and the second arylazo group in position 4' of 1-phenyl group in acidic medium and the third arylazo group in position 7' of 4-naphthyl group of H or  $\gamma$  acid in alkaline medium.

The literature survey shows that trisazo dyes are not very common and many are derived from benzidine, which has been now banned as it is carcinogenic. Further, such dyes with pyrazolone unit are not available in literature; some of the commercial dyes are as under.



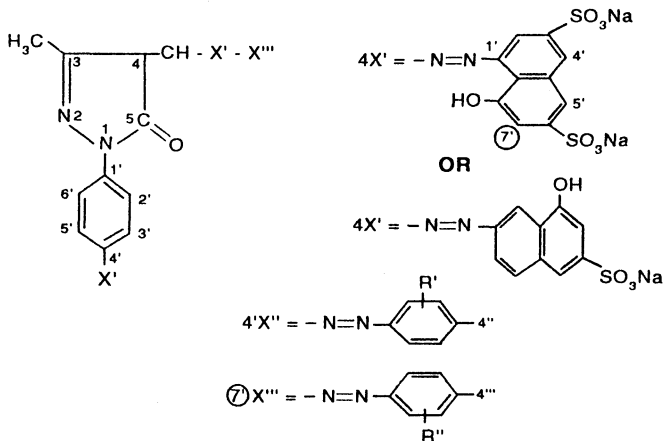
Direct blue 71



Chlorantine fast red

Hence, it was interesting to prepare trisazo dyes with pyrazolone unit. In the present work acid trisazo dyes have been prepared and applied on wool at 50–80°C at pH 3 in presence of acetic acid and on nylon at pH 3 and temperature 85°C in presence of acetic acid with Glauber's salt. It has been synthesised from bis-azo<sup>1</sup> pyrazolone acid dyes earlier.

H-acid or  $\gamma$ -acid (0.01 M) was diazotised at 0–5°C and then coupled at position-4 of 1-phenyl-3-methyl-5-pyrazolone (0.01 M) or 1-(2'-chlorophenyl)-3-methyl-5-pyrazolone (0.01 M) in alkali medium, then arylamine (0.01 M) was diazotised and coupled at position 4' of 1-phenyl-3-methyl-5-pyrazolone (0.01 M) or 1-(2'-chlorophenyl)-3-methyl-5-pyrazolone (0.01 M) in acidic medium; further arylazo salts of different arylamines (0.01 M) were respectively coupled with the bis-azo dyes (0.01 M) in alkali medium by the known method. Trisazo dyes were thus prepared and purified. These are shown in the general structure as follows:



where

$R' = 3$  or  $4\text{-NO}_2$ ,  $4\text{-CH}_3$

$R'' = \text{H}$ ,  $2$  or  $3$  or  $4\text{-CH}_3$ ,  $2$  or  $3$  or  $4\text{-NO}_2$ ,  $2$  or  $3$  or  $4\text{-Cl}$ ,

Series                  No. of dyes

I	10	$4X'$	$3''\text{-NO}_2$	$7'X'''$
II	10	$4X'$	$4''\text{-CH}_3$	$7'X'''$
III	10	$4X'$	$4''\text{-NO}_2$	$7'X'''$

The light and wash fastness are determined by known methods as follows:

	Light Fastness	Wash Fastness
Wool	4–5 to 5–6	3–4 to 4–5
Nylon	3–4 to 5–6	2–3 to 3–4

The shades of these dyes range from red to deep brown on wool and from deep red to green on nylon.

Thus these tris-azo dyes are highly suitable for dyeing wool giving the shades red, brown, maroon, black and green with very good fastness property.

## REFERENCE

1. R.A. Bhavsar and C.M. Desai, *Asian J. Chem.*, **10**, 207 (1998).

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