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NOTES

Synthesis of Some Bis-azo Pyrazolone Acid Dyes and Their Application on Wool, Silk and Nylon

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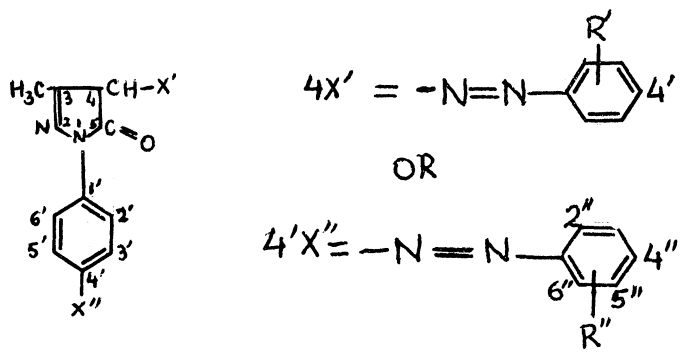
Monoazo pyrazolone dyes are very common but bisazo pyrazolone dyes with arylazo group in position-4 and second arylazo group at position -4 of phenyl nucleus are not available in literature. Firstly aryldiazonium chloride is coupled in position-4 in alkaline medium and the second aryl-diazo group in position-4′ of 1-phenyl group in acidic medium.

Acid monoazo pyrazolone dyes are applied on cellulose fibre in acidic medium containing the electrolytes NaCl or sodium sulphate. In the present work acid bis-azo dyes have been applied on wool at 50–80°C in presence of acetic acid, on silk at 100°C at pH 3 and on nylon at pH 3 and temperature 85°C in presence of acetic acid with sodium chloride.

Aryl amine (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 position-4′ of 1-(2′-chloro-phenyl)-3-methyl-5-pyrazolone (0.01 M) in alkali medium, then aryldiazo salt (0.01 M) or 3-sulphonic aryldiazo salt (0.01 M) or 2′,5′-disulphonic aryldiazo salts (0.01 M) was respectively coupled with the monoazo dyes (0.01 M) in acidic medium at pH 6 by known methods. Bisazo dyes were thus prepared and purified. These are as shown in the general structure:



R′ = H, 2- or 4-CH_3

or

R″ = 2- or 3- or 4-NO_2, 2- or 3- or 4-Cl or 4-Cl, 4-OCH_3.

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Series	No. of dyes		
I	10	-4X′	2″- and 5″-SO_3Na
II	10	-4X′	2′-Cl and 3″-SO_3Na
III	10	-4X′	2″-Cl and 2″- and 5″-SO_3Na
IV	10	3′-, 6′-, 8′-SO_3Na -Napthylazo	2′-Cl and 4′-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
Silk	4–5	4–5
Nylon	3–4 to 4–5	3–4 to 4–5

The shades of these dyes range from yellow to brown on wool, from yellow to green on silk and from yellow to orange on nylon.

It appears that these bis-azo dyes are very suitable for dyeing wool giving shades yellow, orange, green, red, brown with very good fastness property.

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