

The background features a vibrant, abstract design with overlapping organic shapes in shades of pink, light blue, and yellow. A yellow shape in the top right corner contains a pattern of small black dots. The overall aesthetic is modern and artistic.

TOWARDS ENHANCED DYEING PROCESS: ARYLAZO PYRIDONE DYES

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CONTENTS

A brief view of the work contents, whereas the focus is on a textile perspective of synthesized dyes

01. Azo dyes from a textile perspective

Commercially used disperse azo dyes are mainly water insoluble and used for synthetic fiber dyeing such as polyester, polyamides and acrylics in an acid environment

02. Experimental part

Synthesis of azo pyridone dyes and dyeing of fabrics of different chemical composition

03. Characterized dyes and dyed fabric access

Assessment of the achieved results

Azo dyes

The most important part of industrial colorants due to the wide application:



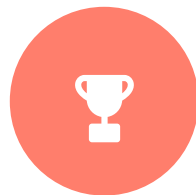
Non-optic materials (NLO)



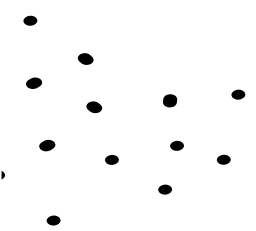
Dye sensitized solar cells (DSSC)



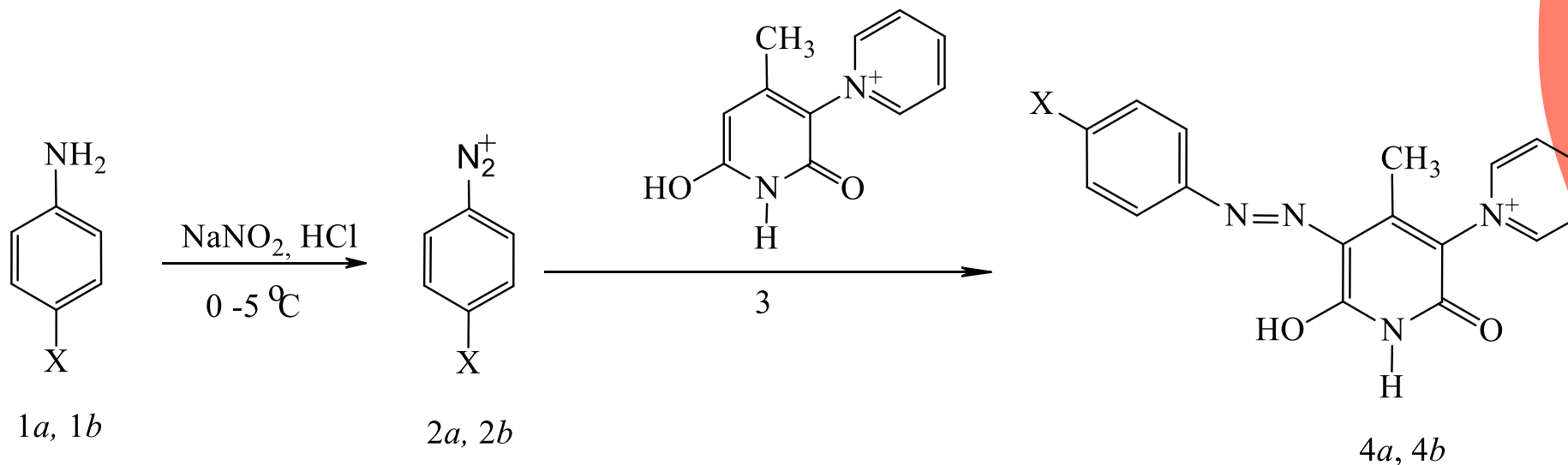
Cosmetics, pharmaceuticals,
medical research



Textile fiber dyeing



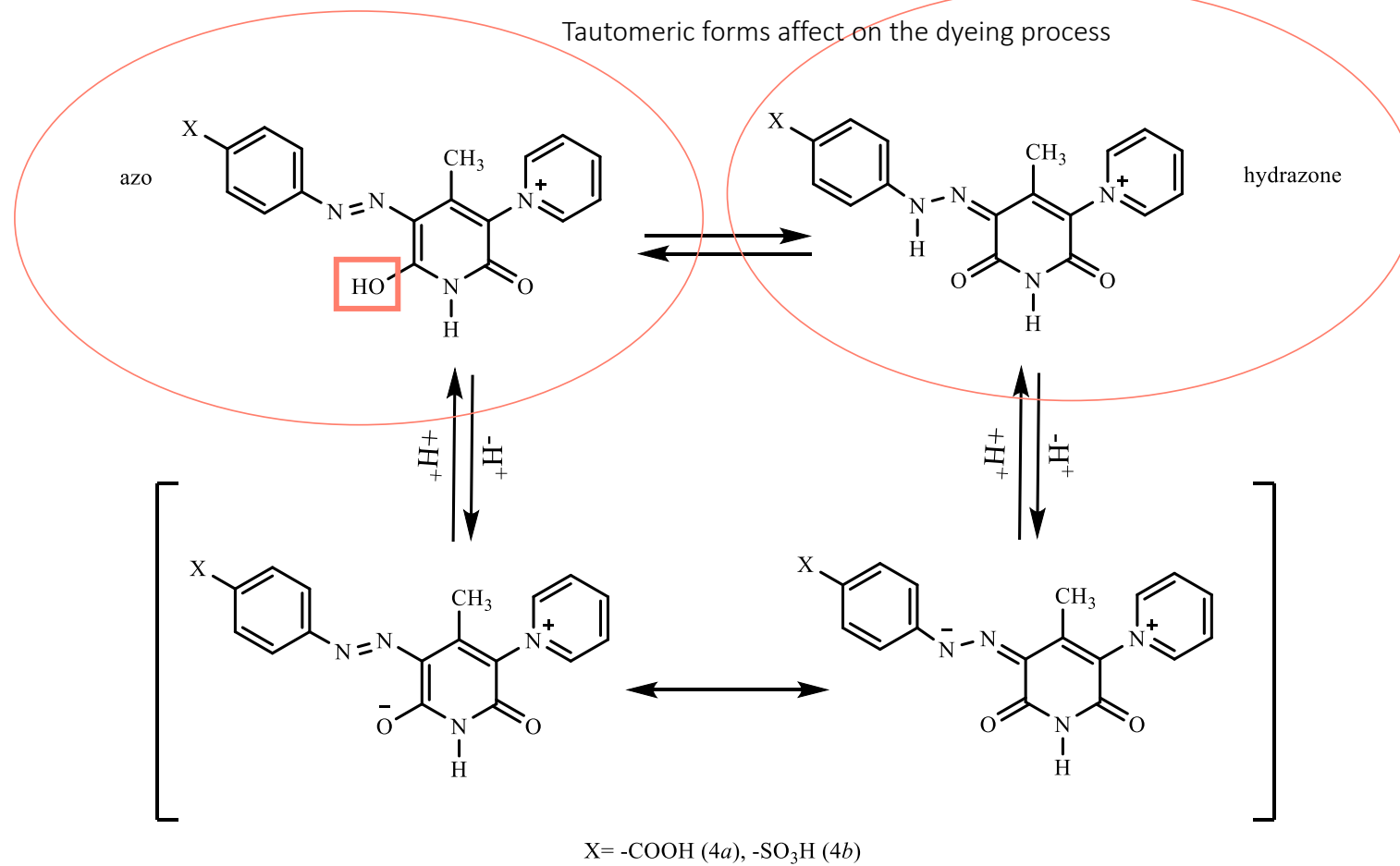
Synthetic procedure:



X= -COOH, -SO₃H

5-(4-substituted-phenyl)-6-hydroxy-4-methyl-3-pyridinium-2-pyridones

A quick turn on tautomeric forms



1. Dominant when found in neutral and acidic environment
2. Dominant when found in basic environment



Dyeing procedure

01.

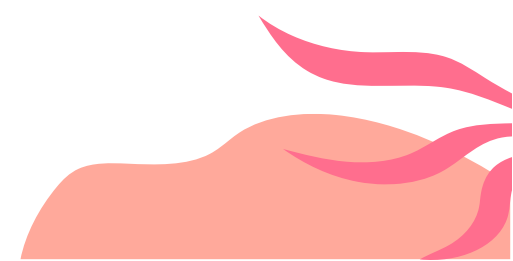
Multifiber Adjacent Fabric TV Style 42 comprising wide bands of: diacetate (CA), bleached cotton (CO), polyamide (Nylon 6. 6) (PA), polyester (PES), acrylic (PAN) and wool (WO) was used as a substrate for dyeing

02.

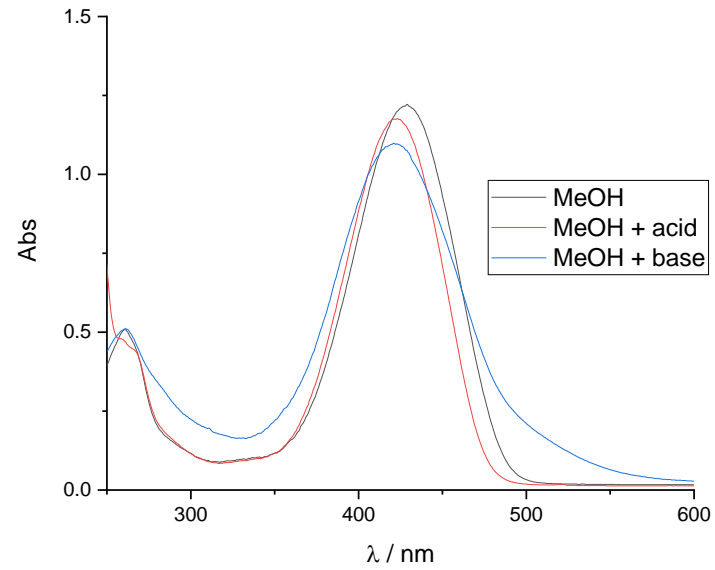
pH 8.5, at 80 °C for 90 min
under constant shaking

03.

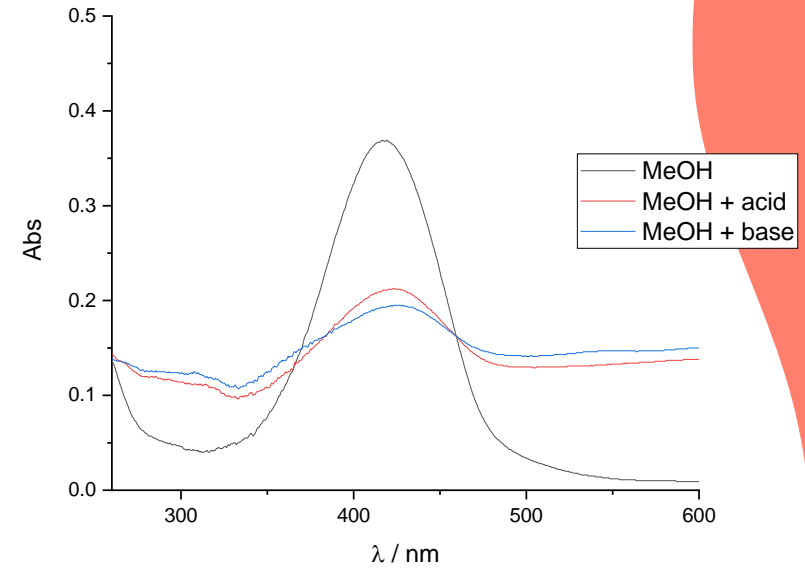
The fabrics' color coordinates (L , a^* , b^*) were measured in the CIELab color space in order to determine the colorimetric properties UV protection factor (UPF) of dyed fabrics was derived from the measurement of transmittance of ultraviolet radiation through fabrics



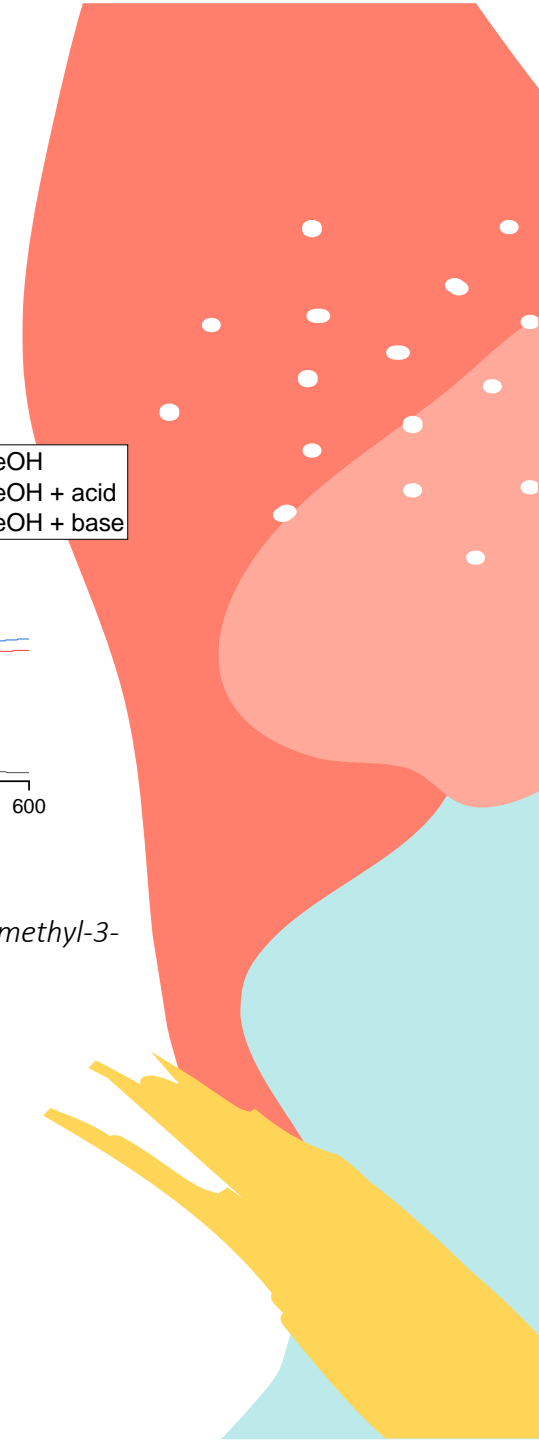
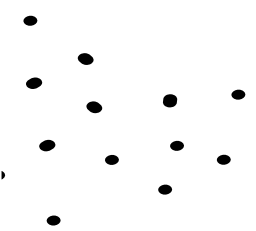
UV-Vis spectroscopy



UV-Vis spectrum of 5-(4-carboxyphenyl)-6-hydroxy-4-methyl-3-pyridinium-2-pyridone

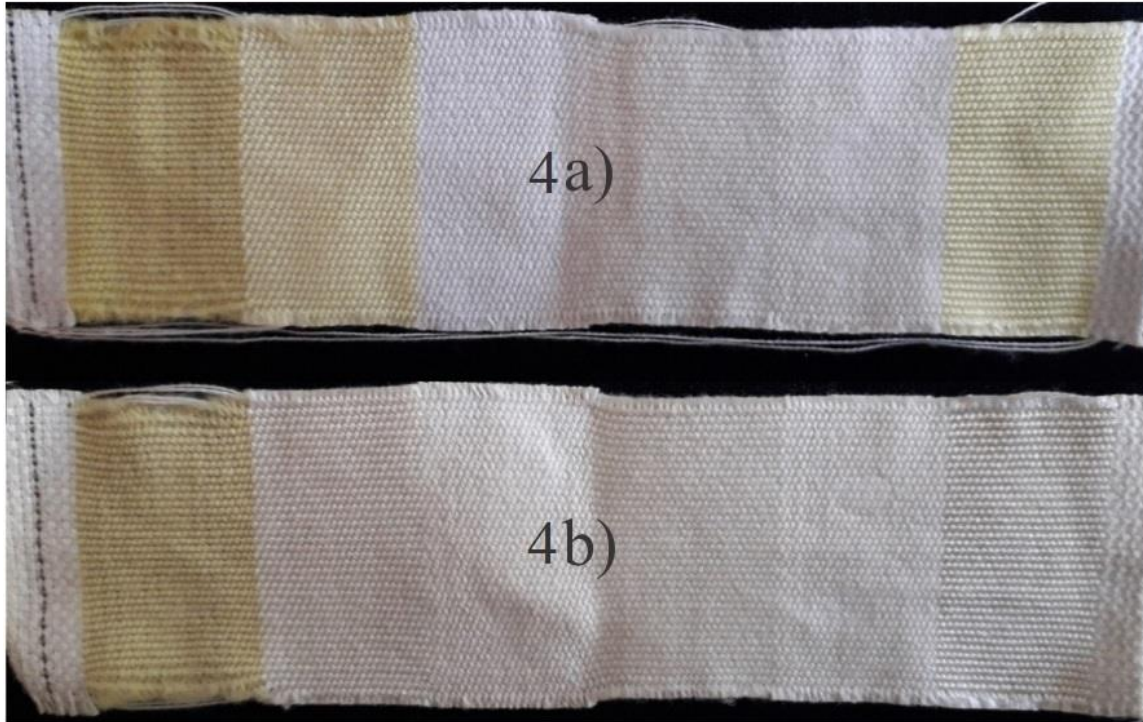


UV-Vis spectrum of 5-(4-sulfoxyphenyl)-6-hydroxy-4-methyl-3-pyridinium-2-pyridone



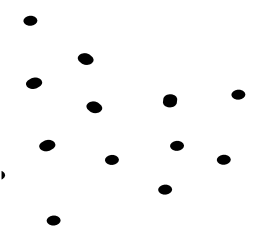
Characterization of dyed fabrics

WO PAN PES PA CO CA



	L	a*	b*
Wool dyed with dye a	85.43	-3.6	50
Wool dyed with dye b	86.55	-5.7	38.7

Dyes selective for wool; They can be successfully utilized for dyeing wool fabric at pH 8.5



Conclusion:



5-(4-sulfoxyphenyl)-6-hydroxy-4-methyl-3-piridinium-2-pyridone and 5-(4-carboxyphenyl)-6-hydroxy-4-methyl-3-piridinium-2-pyridone are stable in alkaline environment based on UV-Vis spectra if dyes and their tautomer forms barely transform due to the pH adjusting



The synthesized dyes probably exist in only one – hydrazone tautomeric form



Studied dyes can be successfully used for dyeing wool at pH 8.5



An increase in wool UV protection factor for about two times.





**Thank you
for your
attention !**