

Accepted Manuscript

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PII: S0143-7208(18)30473-X

DOI: [10.1016/j.dyepig.2018.05.027](https://doi.org/10.1016/j.dyepig.2018.05.027)

Reference: DYPI 6756

To appear in: *Dyes and Pigments*

Received Date: 2 March 2018

Revised Date: 10 May 2018

Accepted Date: 13 May 2018

Please cite this article as: Marsal Agustí, Cuadros S, Cuadros RM, Font J, Manich AM, Dyestuffs and formaldehyde content in split leather treated with formaldehyde resins, *Dyes and Pigments* (2018), doi: 10.1016/j.dyepig.2018.05.027.

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DYESTUFFS AND FORMALDEHYDE CONTENT IN SPLIT LEATHER TREATED WITH FORMALDEHYDE RESINS

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Abstract

Formaldehyde resins are present in textile, leather and wood industries. Due to the harmful character of formaldehyde, different alternatives have been found to exclude or reduce its content on processed goods. However, the effect of dyestuffs on the formaldehyde content of goods containing formaldehyde-synthesized resins has not been studied up to date. The aim of this work is to check if the presence of free amino groups in the structure of dyestuffs exerts an influence on the formaldehyde content on leathers treated with formaldehyde-synthesized resins. Six dyes, belonging to three different families (acid dyes, direct dyes and basic dyes), have been taken as examples to evaluate how their structures affect the reaction with formaldehyde present in leather. The variation of the formaldehyde content in dyed leathers with respect to control samples (treated with resin only) and its evolution with time have been also considered.

It has been found that the ability of dyes in reducing the formaldehyde content in leather depends on the amount of amino groups amenable to reaction with formaldehyde. Those amino groups that in their vicinity have other functionalities, with which to form relatively stable structures, have a reduced reactivity with formaldehyde.

The reduction ability of dyes also depends on the formaldehyde content in leather. The lower the formaldehyde content is in the leather, the higher this reduction ability. Acid Black 234 dye caused a formaldehyde content reduction of approximately 84% in leathers treated with melamine-formaldehyde resin of low formaldehyde content in the analysis carried out after 90 days of leather processing whereas the reduction was approximately 20% when the resin was of high formaldehyde content.

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