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An environmental polyurethane retanning agent with the function of reducing free formaldehyde in leather

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Abstract

Chromotropic Acid Grafted Amphoteric Polyurethane (CAGAPU) was synthesised with Chromotropic Acid (CA) as a modifier for Polyurethane (PU). The structure of CAGAPU was confirmed by FT-IR, ¹H-NMR. The retanning process and the experiments of CAGAPU with formaldehyde indicate the following: (1) The leather retanned by CAGAPU can be comparable or surpassed to the market PU-based retanning system in terms of shrinkage temperature and sensory performance. (2) The leather collagen fibers are smoother and orderly which provides a potential value for the appearance of the leather and fur industry. (3) The CAGAPU retanned system can bring down the free formaldehyde content in aldehyde tanned leather significantly. (4) The optimum dosage of CAGAPU is 20 g and the best retanning time is 6 hours. (5) The CAGAPU retanned system can reduce the free formaldehyde, Biochemical Oxygen Demand (BOD), Total Dissolved Solids (TDS) and Total Suspended Solid (TSS) from the source which retard pound on the economy and environment greatly compare to the traditional governance. Therefore, this paper provides the possibility for the sustainable development of leather. The work has changed the traditional way of "terminal treatment" and realized the "initial treatment" and may also offer a new idea of solving the problem of formaldehyde in the newly decorated houses or in the air.

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