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Preparation of Terminal Phenolic Hydroxyl Triazine Dendrimer and its Combination Tanning Properties with the Aluminum Salts

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Authors [Xi Huai Qiang](#), [Yuan Feng](#), [Hui Zhang](#), [Hong Yan Feng](#)

Keywords [1,3,5-Benzenetriol](#), [Chrome-Tanning Assistant](#), [Cyanuryl Chloride](#), [Hyperbranched Polymer](#), [Leather](#)

Abstract Terminal phenolic hydroxyl triazine dendrimer (HTHP) was prepared by putting cyanuryl chloride and 1,3,5-benzenetriol into acetone and then adding K_2CO_3 into the mixture as deacid reagent, which is called " One Step Process" . HTHP can be used in the leather tanning process as an additive. The result shows that adding HTHP into leather tanning process can improve the combination tanning property of leather collagen. When we add 10% (based on the mass of pickled skin) of HTHP, the shrinkage temperature of crust is 63.11°C and the mechanism of tanning is same as the vegetable tannin which has abundant of plant polyphenol. When the usage of HTHP is 10% and the aluminum salts is 2.5% (consider the mass of Al_2O_3), the shrinkage temperature of crust can reach to 82.2°C. It can be concluded that it shows synergism when there are both HTHP and aluminum salts in the process.

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PREPARATION OF TERMINAL PHENOLIC HYDROXYL TRIAZINE DENDRIMER AND ITS COMBINATION TANNING PROPERTIES WITH THE ALUMINUM SALTS

XIHUAI QIANG^{1,a}, YUAN FENG^{1,b}, HUI ZHANG^{1,c},

AND HONGYAN FENG^{1,d}

¹College of Resource & Environment, Shaanxi University of Science & Technology, Xi'an 710021, China

^aqiangxihuai@163.com, ^bfy1987a@yahoo.cn, ^cgyzhui2001@163.com,

^dfengyan128@163.com

Keywords: cyanuryl chloride; 1,3,5-benzenetriol; hyperbranched polymer; chrome-tanning assistant; leather

Abstract: Terminal phenolic hydroxyl triazine dendrimer (HTHP) was prepared by putting cyanuryl chloride and 1,3,5-benzenetriol into acetone and then adding K_2CO_3 into the mixture as deacid reagent, which is called "One Step Process". HTHP can be used in the leather tanning process as an additive. The result shows that adding HTHP into leather tanning process can improve the combination tanning property of leather collagen. When we add 10% (based on the mass of pickled skin) of HTHP, the shrinkage temperature of crust is 63.11°C and the mechanism of tanning is same as the vegetable tannin which has abundant of plant polyphenol. When the usage of HTHP is 10% and the aluminum salts is 2.5% (consider the mass of Al_2O_3), the shrinkage temperature of crust can reach to 82.2°C. It can be concluded that it shows synergism when there are both HTHP and aluminum salts in the process.

Introduction

Since its novel structure, unique property, and far-ranging application, hyperbranched polymer is concerned by many scientists, and therefore it becomes one of the new synthetic polymer materials in the 21st century^[1]. It is featured with compact, low viscosity, high solubility, and un-inclined to crystallization; the molecule itself is featured with nanometer size, its surface enriches a large number of active functional groups, and the performance required may be obtained by end-modified, therefore the polymer shows an excellent prospect in the high solid content coatings, plasticizers, photoelectric materials, resists, medical materials and other aspects^[2], but its application in leather industry is rarely reported.

Tanning is one of the key processes in leather processing, and different tanning methods are adopted in the tanning process resulting from different tanning agents used. Vegetable tanning is one of the earliest tanning methods used, the tanning agent used in the vegetable tanning process is rich of vegetable polyphenols, the shrinkage temperature (T_s) of the pure vegetable tanned leather is generally low, and can not meet the hydrothermal stability requirements for most of the leather, but this shortcoming can be addressed by the chemical synergistic effect of the combination of the vegetable polyphenols and other tanning agents, in which the vegetable-aluminum (III) combination