Process Innovations in the Development of High Exhaust Chrome Tanning System

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Abstract: Stringent environmental regulations on the discharge of chromium have prompted researchers to seek the development of eco-benign technologies and process innovations aimed at low-waste and high exhaust chrome tanning systems. An enzyme assisted high exhaust chrome tanning method involving the use of enzymes has been developed. The method utilizes minimum amount of enzyme with an uptake of chromium above 97% with good penetration and distribution of chromium in the tanned leather. Kinetics of tanning involving pretreatment with enzyme at different concentration, time intervals and temp has been studied. Tanning isotherms and the fit of different empirical equations for the process have been obtained. The best fit with the experimental values and the absorption rate constants that show higher rate constants and faster kinetics for enzyme assisted tanning process have been obtained. The apparent activation energy for control and enzyme assisted tanning process have been obtained and compared. The final quality of the enzyme assisted chrome tanning process does not disturb the existing or conventional processing of leathers and the technology is cost effective and commercially feasible. **Key words:** process innovations; high exhaust chrome tanning; enzyme assisted