ABSTRACT

Growing concern on the need to protect the environment necessitates the development of cleaner tanning technologies. Tanning is the important operation in leather processing which provides permanent stability against microorganism and increases hydrothermal stability to the collagen matrix. Several tanning agents are in use; among these chrome and vegetable tanning agents play a major role in tanning the hides and skins. Nevertheless, these tanning agents afford waste streams with very high concentration of BOD, COD and TDS in the conventional tanning process. Such large amounts of pollution pose a serious environmental threat. The need to develop a cleaner tanning technology from the proteinous source is the primary aim of the study. In the present study, fleshing a potential solid waste has been utilized for the development of Reactive Protein. The Reactive Protein as a tanning agent for stabilising the delimed pelt is studied. Combination tanning study using chrome, vegetable tannin, high exhaust tanning systems for vegetable and chrome tanning and retanning study in the post tanning operation of leather processing for the application of Reactive Protein have been studied. Several studies in tanning such as shrinkage temperature, differential scanning calorimetry studies, exhaustion studies, $^1$H NMR studies, FT-IR studies in the tanning process and colour matching studies, scanning electron microscopic studies and physical strength properties in the subsequent processed leathers indicated possibility to reduce chrome and vegetable in the tanning process. The tanning system
developed with Reactive Protein offers better chrome exhaustion, vegetable tannin exhaustion, leather with high shrinkage temperature, color matching properties and physical strength properties to the resulting leather. The tanning systems developed with Reactive Protein not only provides an eco-friendly approach but also paves the way for the reduction of solid wastes in the leather processing industry.