

Study on Biodegradation of Several Chrome-free Goat Garment Leathers

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Abstract: The biodegradability of chrome tanned leather, vegetable tanned leather, organic phosphonium tanned leather, organic phosphonium-zirconium combination tanned leather and organic phosphonium-aluminum combination tanned leather was studied by outdoor soil burial method. The results showed that after 150 days of outdoor soil burial in summer, their biodegradation rate respectively reached to 6.15% , 27.50% , 19.92% , 34.83% and 80.88%. The DSC analysis showed that the glass transition temperature (T_g) of leathers with good biodegradability were lower than that with bad biodegradability. The results of SEM observation showed that the surface of leathers obviously became rough after biodegradation. The biodegradability of organic phosphonium-zirconium combination tanned leather and organic phosphonium-aluminum combination tanned leather were much better than that organic phosphonium tanned leather, which illuminated that zirconium and aluminum were benefit for the growth of microorganisms and as well as strengthened the biodegradability of leathers. The vegetable tanning agent was natural product, so the biodegradability of vegetable tanned leather was good. The biodegradability of chrome tanned leather was the worst as chrome was poisonous to microorganisms. The study provided theoretical support for the production of environmentally friendly leather and the alleviation of environmental stress.

Key words: outdoor soil burial method, biodegradability, leather