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Keywords

clearing, fabric softener, hydrogen peroxide, ozone, polylactic acid (PLA), strength, viscosity

Polylactic acid (PLA) became the first synthetic thermoplastic polymer to be produced commercially on a commercial scale, from 100% natural resources. It is a biodegradable polymer based on lactic acid ($C_3H_5O_2$). PLA is traditionally an aliphatic polyester (Figure 1).
 PLA exhibits a number of advantages: PLA degrades readily through hydrolysis, which renders it compostable. It is also biodegradable, together with its green manufacturing process and ability to be processed as a standard thermoplastic. Environmental initiatives encourage the use of PLA as a particularly attractive production material over quite widely exploited.
 PLA exhibits a number of advantages with respect to its performance for textile applications. As has been observed, there are some similarities and distinctions with conventional multi-spin yarns. It can, for example, be dyed with disperse dyes, as PET. However, in order to maximize its benefits, PLA needs to be processed under somewhat modified conditions. For example, fibres based on PLA (especially when it is blended with cotton) must withstand the conditions of complex hot-dye processes such as

reduction and/or disperse dyeing and alkaline-reduction clearing (going to the hot T₁ and washing part) of PLA, such processes must be carried out at a lower temperature than would be needed for PET. Moreover, PLA is particularly susceptible to hydrolysis under hot alkaline conditions, which means that the pH must be lower than would be the case for PET.
 Scouring and bleaching are two additional operations that are routinely carried out on cotton fibres and bring similar problems in relation to PLA. In

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