INTENSIFICATION OF ENZYMATIC BIO-PROCESSING OF COTTON BY LOW INTENSITY UNIFORM ULTRASOUND FIELD

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Abstract

Use of enzymatic processing in textile applications is becoming increasingly popular, primarily because of rapid introduction of a new variety of highly efficient enzymes. In general, enzymatic bio-processing generates less toxic and readily biodegradable wastewater effluents. However, enzymatic bio-processing has several critical shortcomings that impede its wide acceptance by industries: expensive processing costs and slow reaction rates. Our research found that on a laboratory scale, introduction of ultrasonic energy in the reaction chamber during enzymatic bio-preparation/bio-finishing of cotton resulted in a significant improvement in enzyme efficiency. The combination of enzymatic bio-preparation/bio-finishing with sonication could significantly advance this new "green chemistry" process making it more suitable for widespread industrial implementation and greatly reducing the amount/toxicity of wastewater, energy consumption, and processing costs.