



This research study explores the possibilities of printing enzymes on textiles using several resource-efficient technologies. Digital inkjet printing is combined with enzyme technology to ensure minimum use of water, chemicals and energy in textile manufacturing processes. The strategies of this study can be used to develop advanced textiles for several applications, for example, in antimicrobial, drug delivery and bio-sensing.

Strategies to formulate an ink containing enzyme are studied here. Optimization of ink formula and printhead are performed to ensure minimum effect on lysozyme and tyrosinase activity. Polyester (polyethylene terephthalate) and polyamide-6,6 fabrics are pre-treated by alkaline, enzymatic and plasma methods to understand their effect on printed enzyme's adhesion, binding and activity retention. Results show that printed tyrosinase can bind lysozyme on plasma activated polyamide-6,6 fabric. This fabric can inhibit bacterial growth and retain almost half of its initial activity when cold stored for a month.

# ENZYME PRINTED FABRICS

TUSER T. BISWAS

*Bio-functionalisation of Synthetic Textiles by Digital Inkjet Printing*

