



'Enzymatic modification of specialty sisal fibers'

Elisabetta Aracri



PROGRAM DESCRIPTION

- Application of laccase-facilitated fiber modification systems to sisal pulp fibers
- Optimization of enzymatic treatment conditions with respect to fiber charge and paper strength properties
- Analysis of the changes imparted to lignin chemical structure by the enzymatic systems

TECHNICAL DETAILS

- Laccase-induced grafting of phenolic compounds will be used to modify unbleached sisal fibers properties
- Modifications of fiber properties will be investigated using instrumental techniques and the testing of physical strength
- Modification of lignin chemical structure will be studied by NMR analyses

PAYOFF

- Biografting of lignocellulosic fibers is a versatile functionalization method which allows bonding a wide range of laccase substrates to fiber matrix
- Laccase modification is a novel and environmentally friendly approach for tailoring and/or boosting fiber and paper properties

KEY ACCOMPLISHMENTS

- Evaluate the impact of laccase modification systems on fiber acid content and strength properties
- Use surface analysis technique (SEM) to study the treatment effects on fiber surface
- Elucidate the reaction mechanisms behind laccase-catalyzed grafting of phenolic substrates onto sisal fibers

