

NATURAL ANTIOXIDANTS AS STABILIZERS FOR POLYETHYLENE

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ABSTRACT

In order to defend against damage from oxidation, organisms have developed complex antioxidant activity to scavenge reactive oxygen species (ROS) thereby protecting key biological sites from oxidative damage. These antioxidants are either produced by the body or derived from diets. The desire for new sources of safe and inexpensive antioxidants of natural origin has resulted in considerable interest in herbs and spices as sources of natural antioxidants. Several studies have found many commonly used herbs and spices to be excellent sources of natural antioxidants which contain a diverse array of compounds such as phenolic acids, flavonoids, tannins, vitamins and terpenoids that account for their antioxidant properties. The area of polymer degradation and stabilization is still an area of appreciable industrial interest supported by corresponding research activities in several universities and industrial laboratories. In this contest, the interest for natural antioxidant is also motivated by the necessity to increase the amount of natural substances in the compounding of polymers.¹⁻³

In this communication, we disclose the excellent polyethylene (PE) stabilizing properties of a stable lignin-related phenolic biopolymer produced by oxidative polymerization of caffeic acid methyl ester (CAME).

Characterization of LLDPE films by thermal methods (DSC and TGA), photo-oxidative treatments combined with chemiluminescence and FTIR spectroscopy, and mechanical tests indicated an efficient protective effect of polyCAME on PE durability in service conditions.⁴

PolyCAME is thus proposed as a novel easily accessible and biocompatible stabilizer for PE films for potential use in packaging and other applications (Fig.1)

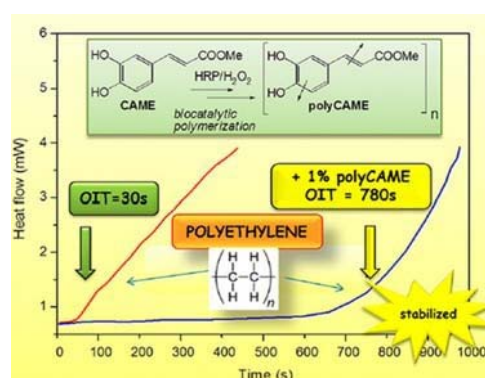


Fig.1 OIT of LLDPE stabilized with polyCAME

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