

Evaluation of Ethylene Absorption Capacity of “Profresh”-based Films

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Two samples of masterbatch materials and five film samples with claimed ethylene scrubbing ability were evaluated. The masterbatch called “ProFresh” is the ethylene-absorbing material incorporated at 5-20% into polyethylene films. Five films that were manufactured by different companies, included blue film from India, Irish film (with 15% ProFresh masterbatch), Argentinean film, Indian film marked with “H”, and “LongFresh” film from Indonesia. These films were supplied by E-I-A Warenhandels GesmbH, Wien, Austria.

The ethylene removal capacity of all products was evaluated in a static system in comparison with the positive control material (potassium permanganate; $KMnO_4$) and control (no absorber). A sample of 50 g from each of the masterbatch samples (X and Y) and $KMnO_4$ was used. The films were cut to obtain a surface area of 30x60 cm to provide an equal absorbing area. Two tests were conducted with three

replicates per material tested in one-liter jars in each test. The jars were sealed and injected with four parts ethylene to one million parts air (4 ppm). The ethylene concentration was measured, using gas chromatography, at 1, 4, 8, and 24 hours after sealing.

About 10% reduction in ethylene concentration was found during the first hour followed by additional, slight decrease for up to 8 hours before the materials became saturated (Fig. 1 and 2). At 24 hours material Y seemed to continue absorbing ethylene but at a very low rate (Fig. 1). All the plastic films followed the same trend as the materials incorporated in the films (material X and Y). They maintained their ethylene absorption ability up to 8 hours before becoming saturated (Fig. 2). However, the ability of ethylene removal by all new products tested was far lower than that of $KMnO_4$.

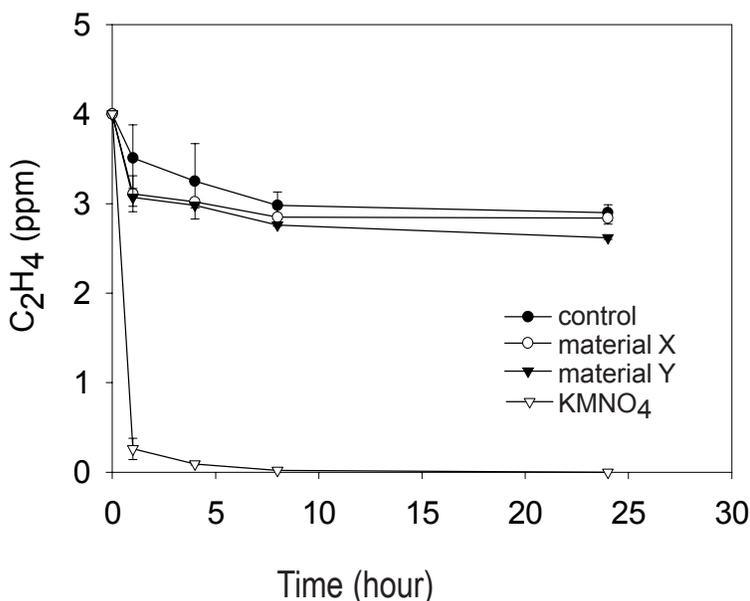


Figure 1. Ethylene absorption capacity of the master materials and $KMnO_4$

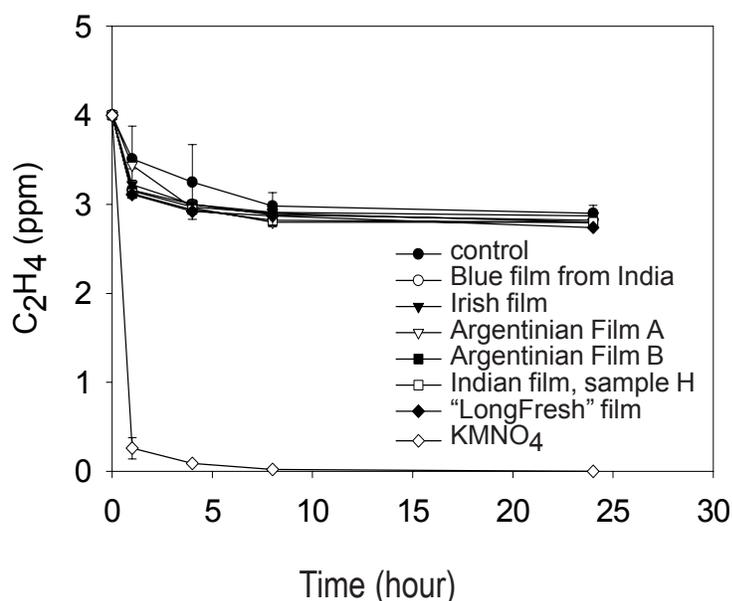


Figure 2. Ethylene absorption capacity of new films and $KMnO_4$