Properties of EVOH and TIF Films for the Reduction of Fumigant Dosage and VOC Emission

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The incorporation of a thin layer of ethylene vinyl alcohol copolymer (EVOH) into a standard polyethylene based film allows for significant reductions of fumigant dosage and total VOC emissions into the environment without altering film properties critical to ease of use in the field.

This paper will review the properties of EVOH significant to its use in mulching film applications, including direct comparisons of the permeation rate of methyl bromide, methyl iodide, chloropicrin, and the cis and trans isomers of 1,3-dichloropropene versus a other polymers such as polyamide and polyethylene. The industry has coined TIF or 'totally impermeable film' to refer to the excellent fumigant barrier of this technology.

As a polar resin EVOH must be coextruded with adhesive resins to produce a functional composite with structural resins like polyethylene; for this reason, the adhesion properties of EVOH to functionalized adhesive resins will be presented. The infrared absorbance spectrum and ultraviolet light resistance of EVOH will also be reviewed.

Kuraray America, Inc. has been marketing EVOH under the EVAL™ trade name into different markets for over three decades. Current markets served include food packaging, automotive fuel components, and industrial packaging. EVOH is used in food packaging for its excellent oxygen barrier and in the automotive market for the containment of hydrocarbon vapor in fuel systems. In agriculture, EVOH is used as a contact layer to provide mechanical integrity to blow molded plastics bottles used for the packaging aromatic solvent based concentrated pesticides.