Title Performance of TiO_2 powder coated packaging film in ethylene removal

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Abstract

TiO_2 powder-coated packaging film using nanoparticle and microparticle TiO_2 were manually prepared on oriented polypropylene film (OPP) by printing method. The film had a slightly white appearance, and TiO_2 powders were distributed on the surface of OPP film. Nanoparticle TiO_2 powder-coated packaging film showed good photocatalytic activity for the decomposition of ethylene, a primary contaminant in horticultural packaging. Photocatalytic activity for the decomposition of ethylene was decreased when TiO_2 particles size was increased. Microparticle TiO_2 powder-coated film showed a slightly decomposition of ethylene as compared to nanoparticle TiO_2. When applied nanoparticle TiO_2-coated packaging film as an ethylene removal packaging, ethylene concentration inside a TiO_2-coated packaging film bag of tomato fruits was 70-80% lower than that in an uncoated plastic film bag. This study demonstrates the possibility to apply the TiO_2-coated film to quality management as an ethylene removal packaging.