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## Study on ethylene gas permeability of double-layer composite film

### ABSTRACT

Fresh vegetables and fruits are still breathing after harvest. This produces ethylene gas which activates ripening and rottenness, leading to a reduced storage time of the fresh produces. Therefore, it is interesting to study and develop a smart packaging that can facilitate ethylene permeation to prolong their storage time. In this research, double-layer composite film will be prepared for such application. The film consists of low density polyethylene (LDPE) and styrene ethylene butylene styrene block copolymer (SEBS) modified with zeolite ZSM-5. This is because zeolite ZSM-5 is highly selective for ethylene adsorption and can be readily used as an additive for ethylene permeation film. The zeolite contents will be varied by 5, 10, 20 and 30 wt% in SEBS layer. The double-layer composite film will be fabricated by compressing of LDPE and SEBS/ZSM-5 films. The morphology, thermal stability and mechanical property of double-layer composite film will be investigated. In addition, the effects of zeolite loading and film morphology on ethylene, oxygen, carbon dioxide and water vapor permeation will be highlighted.