

**Title** Use of charcoal film in sulfur dioxide emitter  
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### **Abstract**

Use of sulfur dioxide and low temperature storage are the predominant method to control mold growth and browning during post harvest storage. Persimmon fruit is a unique produce planted in north Taiwan area, however, the harvesting season is only in 2 mo. Persimmon products are typical stored in a freezer to prevent browning process and microbial growth, which may result in a poor texture. Therefore, persimmon package installed with sulfur dioxide emitter may be advantageous for storage at refrigeration with an acceptable shelf-life. This study aimed to develop a sulfur oxide emitter using a charcoal coated film as the carrier, and the sulfur dioxide emitter was then applied to the persimmon package. Charcoal film was fabricated by depositing bamboo charcoal particles on a paperboard. The sulfur dioxide emitter was constructed by spraying saturated sodium metabisulfite solutions on the film, and then dehumidified under vacuum. Optimal inclusion of chemical in film was analyzed using different solvents. Persimmon products were packed in different gas packages at refrigeration, and the quality of persimmon was determined by the extent of browning and microbial growth during storage. Emission of sulfur dioxide (up to 60 ppm in headspace) was related to the inclusion of sodium metabisulfite solution in the charcoal film in an empty package, and the releasing rate was affected by the RH% at refrigeration. Browning process was suppressed when package deposited with a sulfur dioxide emitter compared to air package. Use the modified atmosphere coupled with sulfur dioxide was more efficient to control browning process and microbial growth in persimmon products storage at refrigeration. Use of the charcoal film as the carrier for sulfur dioxide generating reaction is capable of emitting this dual functional gas in the persimmon product packages, and the fabrication of this emitter is easy and quick.