

**Title** Development of mono and multilayer antimicrobial food packaging materials for controlled release of potassium sorbate

**Author** Metin Uz and Sacide Alsoy Altinkaya

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### **Abstract**

In this study, cellulose acetate (CA) based mono and multilayer films including potassium sorbate (Psb) as an antimicrobial agent were prepared using dry phase inversion technique. To achieve appropriate controlled release of Psb, the structure of the films was changed by manipulating the film preparation conditions. In particular, the initial casting composition, wet casting thickness and drying temperature were varied. Results indicate that Psb release rate decreased as the CA content in the casting solution, the wet casting thickness and the drying temperature for both mono and multilayer films were increased. Compared to the results for the monolayer films, a significant decrease of Psb release rate through the multilayer films was recorded. Drying-induced crystallization was observed in the monolayer films. As a consequence of this, a fast initial release of Psb, controlled by Fickian diffusion, was followed by a slower release controlled by dissolution of Psb crystals. In multilayer films, no crystals were detected in the structure and the release rate was regulated only by diffusion of Psb through the film. The results suggest that the films prepared in this study can be used as food packaging materials for achieving controlled and extended release of Psb.