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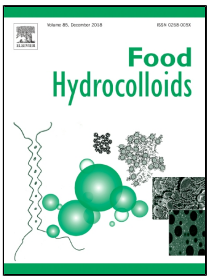

A pH and NH_3 sensing intelligent film based on *Artemisia sphaerocephala* Krasch. gum and red cabbage anthocyanins anchored by carboxymethyl cellulose sodium added as a host complex

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Abstract

The aim of this work was to prepare an intelligent *Artemisia sphaerocephala* Krasch. gum (ASKG)-based film capable of anchoring the natural dye extracted from red cabbage (RCA). For this purpose, carboxymethyl cellulose sodium (CMC·Na) was selected as a host complex. Zeta-potential, Fourier-transform infrared spectroscopy, X-ray diffraction, rheology, and release results revealed that RCA interacted with CMC·Na through electrostatic interactions and altered the complicated spatial structure and crystal structure between ASKG and CMC·Na. The tensile strength, light-transmission and transparency of the films decreased after adding RCA, while elongation at break and water-vapor permeability increased. The RCA solution exhibited a color change from pink to green along with pH variations ranging from 3.0 to 10.0. Additionally, the RCA-containing ASKG/CMC·Na-blended films responded to buffer