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Polymer-Based Smart Packaging for Agriculture and Food Industry

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Abstract

Sustainable agriculture and food waste reduction are key strategies toward achieving global food safety and security. Due to their advantageous properties, versatility and tunability, polymers have found application in smart packaging for the food and agricultural industry, with enhanced performances attributed to improved properties and additional functionalities. Modified polymers and polymer composites have been employed in enhanced passive, active (scavenging and emitting), and intelligent food packaging, encompassing indicators, sensors, and data carriers. Stimuli-responsive polymers have been investigated for use in smart packaging for agricultural applications, in controlled release systems for agrochemical delivery and management of soil moisture levels, and in sensors for monitoring soil health.