

Eco-friendly functional cellulose paper as a fire alarming via wireless warning transmission for indoor fireproofing

X. Li; J. Sánchez Del Río Sáez; A. Vázquez López; X. Ao; R. Sánchez Díaz; D.Y. Wang

Abstract-

Herein, a strategy for fabricating wallpaper-based smart fire-warning systems to monitor and mitigate indoor fires is proposed. The fire-warning system, based on eco-friendly cellulose paper (CP), is produced via a simple dip-coating technique and provides flexibility, rapid low-temperature warning, and novel local and remote wireless signal conversion capability. Specifically, this fire-warning system can balance flexibility and flame retardancy, reducing the negative impact on the mechanical properties after adding flame retardants. Furthermore, the proposed fire-warning system meets the critical requirement of a fast low-temperature warning, showing warning messages within 2s under 250 \pm C, decreasing the response temperature below the combustion temperature of common materials (\geq 300 \pm C). Moreover, the luminosity and temperature data collected can be sent to local and remote computers by wireless conversion. This work gives insight into the new generation of low-temperature smart fire-warning systems, including the contribution of wireless warning signal transmission to achieve smart and efficient fire detection.

Index Terms- Smart wallpaper-based fire alarm; Cellulose paper; Low-temperature warning; Wireless signal conversion

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