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

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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°C, decreasing the response temperature below the combustion temperature of common materials (&gt;300°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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