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Application of Sorptive Passive Panels for Reducing Indoor Formaldehyde Level: Effect of Environmental Conditions

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Abstract : Reducing formaldehyde concentration in residential buildings is an important challenge, especially during the summer. In this study, a ceiling tile was used as a sorptive passive panel for formaldehyde removal. The performance of this passive panel was evaluated under different environmental conditions. The results demonstrated that the removal efficiency is comprised between 40% and 71%. Change in the level of relative humidity (30%, 50%, and 75%) had a slight positive effect on the sorption capacity. However, increase in temperature from 21 °C to 26 °C led to approximately 7% decrease in the average formaldehyde removal performance. GC/MS and HPLC analysis revealed the formation of different by-products at low concentrations under extreme environmental conditions. These findings suggest that the passive panel selected for this study holds the potential to be used for formaldehyde removal under various conditions.

Keywords : formaldehyde, indoor air quality, passive panel, removal efficiency, sorption
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