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# PROCEEDINGS

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# Evaluation of the self-cleaning efficiency of g-$C_3N_4$ surfaces as a function of temperature and humidity

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This work focuses on the study of self-cleaning properties of surfaces modified with thermally exfoliated graphitic carbon nitride (g-$C_3N_4$), which represents a promising photocatalytic material active in the visible region of the spectrum. The prepared material was applied to model substrates, and its self-cleaning efficiency was evaluated according to the UNI 11259:2008 standard, based on the degradation of the organic dye Rhodamine B. Experimental measurements were carried out in a climate chamber under simulated daylight illumination. The influence of various combinations of temperature and relative humidity on the rate of photocatalytic dye degradation, and thus on the self-cleaning efficiency, was systematically investigated with the aim of approximating real outdoor conditions.

The results show that both, temperature and relative humidity significantly affect the photocatalytic activity of the prepared surfaces. Conditions leading to optimized self-cleaning performance were identified, as well as regimes where the efficiency is limited. These findings contribute to a better understanding of the behavior of g-$C_3N_4$-based materials under realistic application conditions and may serve as a basis for their practical use in outdoor self-cleaning coatings. The presented work thus provides important insights into the influence of environmental factors on the performance of photocatalytic surfaces and contributes to their more efficient design for practical applications.

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