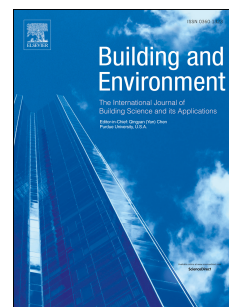


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Pathways of conversion of nitrogen oxides by nano TiO₂ incorporated in cement-based materials

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Abstract

The ability of photocatalytic cementitious materials to degrade nitrogen oxides (NO_x) has been widely used to evaluate their air-purifying function. However, attention has been predominantly placed on the changes in the NO_x concentration but the fate of the degradation products is seldom investigated. This study presents a preliminary laboratory investigation on the photocatalytic NO_x degradation of nano titanium dioxide (TiO₂) incorporated self-compacting glass mortar (SCGM). Focus was mainly placed on the generation and distribution of the degradation products, nitrite (NO₂⁻) and nitrate (NO₃⁻), during the NO_x removal process. The results showed that the photocatalytic SCGM induced an apparent decrease of NO together with a slight increase of NO₂ under UVA irradiation. Meanwhile, the amount of the generated NO₂⁻ and NO₃⁻ on the surface of the tested samples, in the suspended aerosols, and in the flowing air stream increased as the photocatalytic reaction progressed. The accumulation of NO₂⁻ and NO₃⁻ on the sample surface led to a slight deactivation

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