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Experimental investigation of photocatalytic effects of concrete in air purification adopting entire concrete waste reuse model

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HIGHLIGHTS

- The research used concrete waste for air purification purpose.
- Entire concrete waste reuse model was adopted in enhancing reuse of waste concrete.
- The study identified proper rates of concrete wastes in concrete mixture design.
- Recycled aggregates coated with TiO₂ improved concrete capacity in degrading NO₂.
- Micro-structure of recycled aggregate concrete coated with TiO₂ was observed.

Abstract

This research investigated the capacities of recycled aggregate concrete adopting entire concrete waste reuse model in degrading NO₂. Two major issues within environmental sustainability were addressed: concrete waste reuse rate and mitigation of hazardous substances in the polluted air. The study consisted of two stages: identification of proper replacement rates of recycled concrete wastes in new concrete mixture design, and the evaluation of photocatalytic performance of recycled aggregate concrete in degrading NO₂. It was found that replacement rates up to 3%, 30%, and 50% for recycled powder, recycled fine aggregate, and

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