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PHOTOACTIVE GLAZED POLYMER-CEMENT COMPOSITE

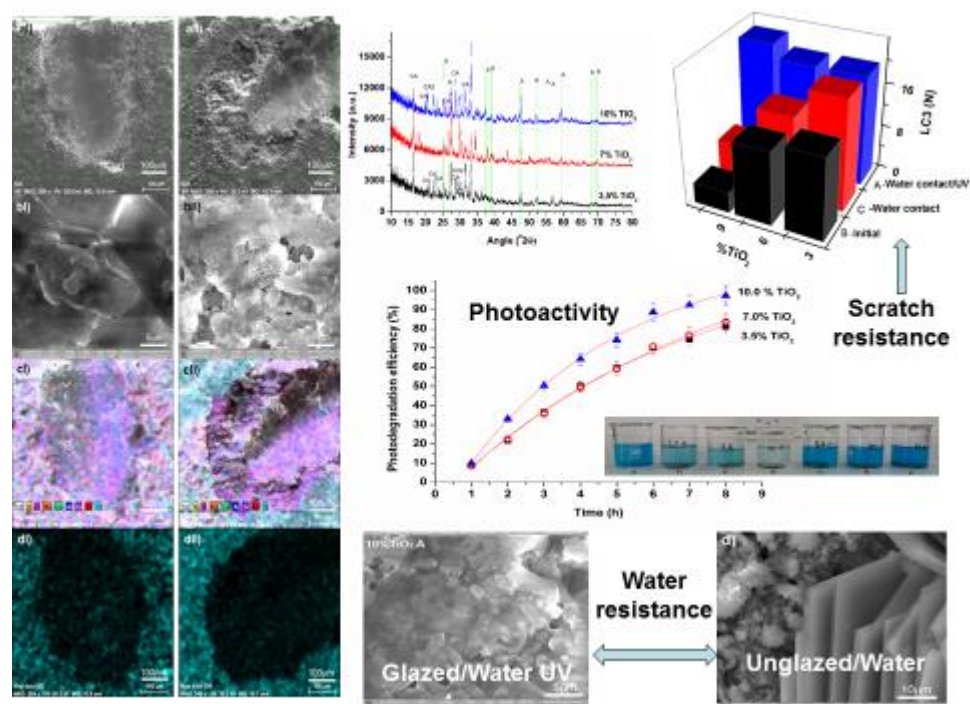
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Graphical abstract



Highlights

- Photoactive, transparent/white glazed MDF polymer-cement composites, were produced
- Enamels silica based with up to 10% TiO₂ nano powder, brushed and fired at 1050°C
- Anatase was not completely turned to rutile and high photocatalysis efficiency was obtained
- Higher TiO₂% increases the glaze porosity/photoactivity & decreases glaze adherence
- Glaze adherence and its TiO₂ % dependency increase upon its exposure to water&UV

Abstract: Macro defect free cements (MDF), a kind of polymer-cement composites, are characterized by remarkably high mechanical properties. Their flexural strengths are 20-30 times higher than those of conventional cement pastes, nearly equal to that of an ordinary steel. The main drawback of MDF cements is their sensitivity to water. This paper presents a method to both diminish the negative impact of water on MDF cements mechanical properties and to enlarge their application by conferring photoactivity. These tasks were solved by glazing MDF cement with an ecological glaze containing nano-particles of TiO₂. Efficiency of photocatalytic activity of this material was tested against methylene blue aqueous solution (4.4 mg/L). Influence of the photocatalyst concentration in the glaze paste and of the contact

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