

Nanomaterials and Nanotechnology

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Application of nanotechnology for the sustainable building materials

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Environmental and sustainability concerns have driven the building industry to develop new and more durable sustainable building materials. The development of nanotechnology and nanomaterials offers an opportunity for the development of innovative, durable and multifunctional building materials. This article gives an overview of current and near future applications of nanotechnology and nanomaterials in concrete and bio-based building materials aimed at achieving high-performance building for a more sustainable future. In this article the application of nanotechnology in building materials is focused on lighter and stronger structural composites, multifunctional properties of cementitious materials and enhanced hydrothermal properties of bio-based insulation material. Some of these applications are explained in detail, including self-healing and self-sensor concretes, self-cleaning and hydrophobic surface coating and fire protection. After presenting the significance of innovations of nanotechnology in concrete and bio-based materials, the potential environmental and health risks associated with the adoption of this technology are discussed and finally the ISO BIO

project is presented as a case study. It proposes an innovative strategy to bring bio-based construction materials into the mainstream. The ultimate goal of the project is to optimize the construction process and create more energy-efficient buildings that will lead to a strengthening of the competitiveness of the European construction sector in the field of “green” construction technologies. The data here would be beneficial to both construction engineering education and research.

Speaker Biography

Yunhong Jiang obtained his PhD (2011) in Chemical Engineering from the University of Leeds, after his BEng (2003) and MSc (2006) from China. He has been working on nanomaterials and bio-based sustainable materials and have extensive research experience in nanomaterials synthesis, materials characterization, sustainable chemistry and functional nanostructure materials. He has published over 20 peer-reviewed journals (h-Index of 11) and one book chapters. He has been invited as a reviewer more than 30 times by 16 different peer-reviewed journals and has been awarded the outstanding contribution in reviewing for composites Part A (2017). He has been serving as an editorial board member of reputed journals.

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