Title: How to use a 10-m^3 experimental chamber to assess NO photocatalytic degradation over a short period of time and under real-world conditions?

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For a few years, the improvement of indoor air quality has become a major concern of industrial countries and a priority in the French legislation. Indoor air is contaminated by a variety of gaseous and biological pollutants, which impact human health, comfort and productivity. Building materials, decorative products and furniture are regularly mentioned as potential sources of pollution in indoor environment. Moreover, urban areas are highly polluted with nitrogen oxides (NO_x=NO+NO_2) produced by intensive human activity, notably transport. In housing, NO_x are produced by domestic combustion devices such as gas burners for cooking and come from outdoor pollution (infiltration). Depolluting materials active indoor have thus received increasing attention in recent years. The application of a photocatalytic coating based on TiO_2 to surfaces is a promising method. However, most of research work in the litterature focused on the efficiency of such product at the laboratory scale under controlled conditions. This paper investigates a new test method to assess and compare over a relatively short duration the effectiveness of air depolluting materials in conditions approaching those of real-world. A 10-m^3 experimental chamber was equipped to study the photocatalytic degradation of nitric oxides NO. Firstly, the experimental setup used to highlight photocatalytic activity of tested samples was presented. The adequacy of the defined experimental parameters was justified. Secondly, various photocatalytic treatments applied to plasterboard surfaces were tested. In addition, the effects of illumination and photocatalytic dispersion formulation on NO degradation efficiency by photocatalysis were studied.

Biography

Dr. J. Hot is a lecturer in Civil Engineering at Toulouse University/LMDC in France (LMDC: Laboratory of Materials and Durability of Constructions). She was recruited in September 2015 to develop research activities on indoor air quality, the comfort and the health of building occupants. Her area of expertise is twofold: the study of indoor air depollution by photocatalysis at a laboratory scale with a photoreactor and in real-world conditions using a 10-m^3 environmental chamber; and the characterization of the VOCs emissions of building materials. She is notably in charge of the development of the experimental procedures related to indoor air quality.

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