

Existence of Nano-Organic Carbon Particles below the Size Range of 10 nm in the Indoor Air Environment

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Abstract : Indoor air environment is a big concern in the last few decades in the developing countries, with increased focus on monitoring the air quality. In this work, an experimental study has been conducted to establish the existence of carbon nanoparticles below the size range of 10 nm in the non-sooting zone of a LPG/air partially premixed flame. Mainly, four optical techniques, UV absorption spectroscopy, fluorescence spectroscopy, dynamic light scattering and TEM have been used to characterize and measure the size of carbon nanoparticles in the sampled materials collected from the inner surface of the flame front. The existence of the carbon nanoparticles in the sampled material has been confirmed with the typical nature of the absorption and fluorescence spectra already reported in the literature. The band gap energy shows that the particles are made up of three to six aromatic rings. The size measurement by DLS technique also shows that the particles below the size range of 10 nm. The results of DLS are also corroborated by the TEM image of the same material.

Keywords : indoor air, carbon nanoparticle, lpg, partially premixed flame, optical techniques

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