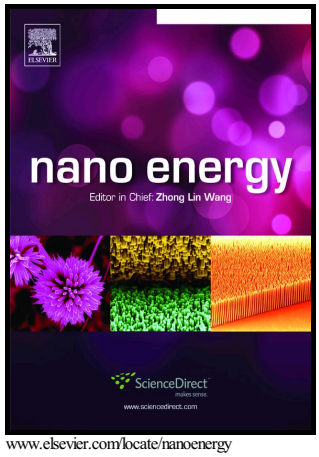


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## Abstract

Particulate matter (PM) pollution has become a serious environmental problem, especially in developing countries, owing to its severe threat to human health. Particularly, airborne $PM_{2.5}$ (mean aerodynamic diameter $\leqslant$2.5 μm) particles are extremely harmful, because the tiny particles can enter human respiratory system and even penetrate into circulatory system. Herein, we propose an effective strategy to recycle $PM_{2.5}$ carbon nanoparticles generated by diesel vehicle engine for the applications of clean energy. After thermal treatment and purification, the $PM_{2.5}$ derived carbon nanoparticles show a diameter distribution between 25–40 nm,