

## The design of a generator exhausts gas cleaner

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The continuous emission of poisonous gases from gasoline generators has contributed to greenhouse effects, global warming, climate change and environmental hazards. The steady proliferation of electric generators, in Nigeria and other African countries, will further aggravate this emission if left uncontrolled. Generator exhaust fumes contain Sulfur oxides (SOX), Carbon monoxide (CO), Nitrogenous gases (NOX) and Carbondioxide (CO<sub>2</sub>). These gases are harmful to human health and the environment.

The speaking submission will discuss how our research team is addressing this problem locally. The solution of an optimal control problem, on the minimization of CO<sub>2</sub> emission, has prescribed conditions upon which the emitted CO<sub>2</sub> could be reduced. Based on these conditions, the speaker will present the design of a sorbent for cleaning Generator exhaust fumes through a compact treatment device. He will explain how the poisonous gases will be selectively removed by passing the fumes through a metal casing containing some magnesium-based scrubber, in monolith form. Obviously, the exhaust gas will not pass through any cooler since the scrubber

will stand the high temperature of the gas. Finally, the speaker will outline the design specification (250 kg/m<sup>3</sup> packaging density of the absorbent, 0.3 m depth of the casing bed, 0.133 m<sup>2</sup> cross sectional area of the bed and 0.41 m diameter of the bed) of this device.

### Biography

**Emmanuel Nwaeze** a senior lecturer at Alex Ekwueme Federal University, Nigeria, is the project team leader. He is an applied Mathematician with special emphasis on renewable energy.

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