

Investigation of plasma chemistry in plasma based diesel exhaust treatment system

Abstract

Increasing environmental pollution is known to cause severe health problems including respiratory diseases and cancer. Environmental norms are getting stricter by the day; many techniques to reduce pollution involving innovative design concepts and fuels have been tried. However, techniques to carry out after-treatment of flue (stack) exhaust gas have reached design saturation. In India, the major pollutant is the diesel exhaust, vehicular and industrial. The diesel engine/generator exhaust gas typically contains particulate matter (PM), CO, CO₂, NO_x, SO_x, hydrocarbons, un-burnt fuel, water vapour etc. in varying proportions resulting in an extremely complex mixture. Plasma technology offers great potential for after-treatment of these exhaust gases. It can achieve simultaneous reduction of PM, NO_x and SO_x. Current project proposal aims to investigate the chemistry involved during the plasma treatment. The student will work in the exhaust laboratory and experiments will be carried out using the plasma modules on the exhaust gas coming out of a 10 kVA DG set at various loads and gas flows. The scope of work is as follows: (i) Analysis of data from emission monitoring system and their interpretation (ii) Investigation of chemical reactions at different loads, gas flows and plasma power (iii) Explore various oxidative and reductive catalysts for developing a hybrid system. The duration of the project is 6 to 9 months. Project is for final year M.E. / M.Tech. Chemical Engineering students.

Academic Project Requirements:

1) Required No. of student(s) for academic project: 1

2) Name of course with branch/discipline: M.E./M.Tech Other

3) Academic Project duration:

(a) Total academic project duration: 36 Weeks

(b) Student's presence at IPR for academic project work: 3 Full working Days per week

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