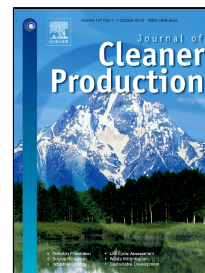


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Clean power production by simultaneous reduction of NO_x and SO_x contaminants using Mazut Nano-Emulsion and wet flue gas desulfurization



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**Clean power production by simultaneous reduction of NO_x and SO_x contaminants
using Mazut Nano-Emulsion and wet flue gas desulfurization**

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Abstract

Combustion of Mazut in power plant generates sulfur oxides (SO_x) and nitrogen oxides (NO_x) that need to be controlled in accordance with the European standard. Most of the pollutant removal methods are effective in removing only one contaminant but not both SO_x and NO_x. In this work, a combined approach is studied to simultaneously control SO_x and NO_x from combustion of Mazut fuel.

This combined approach is consisted of the Mazut Nano-Emulsion usage instead of regular Mazut, as well as, wet flue gas desulfurization or FGD system installation. The wet FGD system removes the SO_x by 80.3% but has no influence on NO_x. The water content equals to by 10% of Mazut volume is used to synthesize the Mazut Nano-Emulsion at optimum performance. The dimensions of fuel droplet are in nano scale (63.7 nm in width and 123 nm in diameter). The Mazut Nano-Emulsion usage removes the NO_x and SO_x by 30.8% and 42.2%, respectively. The approach of Mazut Nano-Emulsion usage and wet flue gas desulfurization leads to simultaneous reduction of SO_x and NO_x in accordance with the European standard. Results show that the combined approach decreases the SO_x and NO_x 79.8% and 78.3%, respectively that satisfied the European standard.

Keywords: Power Plant, SO_x, No_x, Mazut, Nano-Emulsion, Pollution

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