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The prediction of flue gas emissions from the combustion in the industrial tubular heaters

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Abstract. The monitoring of gaseous emissions in a refinery is complex and difficult task requiring special equipment and operators in good physical shape. Some of these emissions could be calculated from other measured data from fixed analysis points. This shall decrease the number of determinations in hazardous circumstances. The authors of this study worked out some equations for the correlation of the main combustion emissions (CO_2, NO_x) with the oxygen content of flue gas and the temperature at the stack. Even though the CO_2 emissions could be predicted by stoechiometric calculations, a model based on statistical processing of hundreds of data is easier to apply; this is why, the authors searched for simple and exact equations. The prediction of CO_2 and NO_x was made versus the the oxygen content of flue gas and the temperature at the stack, which can be measured with fixed sensors. Finally, the prediction of flue gas emissions can be performed by replacing the costly and dangerous sampling, using accurate mathematical model.

Keywords: NO_x emissions, modeling, flue gas monitoring

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