UNIVERSITI TEKNOLOGI MARA

[SIMULATION OF SO_2 AND NO_2 FROM STACK USING ALOHA METHOD]

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ABSTRACT

This research is done based on this five types of pollutants which is SO_2, NO_2, PM_{10}, CO and O_3. These five type of pollutants have different sources of emission for instance SO_2 is produced due to the emission from industrial activities but mainly it is emitted due to the emission from the power plants which uses fossil fuel. For NO_2 the main source of its emission is from the combustion process that takes places in motor vehicles which utilizes the ambient air. The main source of emission for PM_{10} which are emitted directly into the air comes from roads which are unpaved, areas of constructions and also from smokestacks. Whereas for CO the main source of its emission comes from the incomplete combustion process where there is insufficient amount of oxygen. For O_3 the main source of its emission is from chemical reaction between NOx and several volatile organic compounds (VOC). This research will also be mainly carried out in Selangor namely in these five areas which are Shah Alam, Klang, Banting, Petaling Jaya and Kuala Selangor. To obtain the dispersion of these pollutants in each area, softwares such as ALOHA and Google Earth are used to show the dispersion and the source of the parameters in the conditions of the area. ALOHA operates by using the physical characteristics of the released chemical and the real-time circumstances of the release scenario to estimate and predict the dispersion of hazardous gas cloud. Upon obtaining the dispersion, it is moved to Google Earth where the dispersion can be displayed on a graphical image based on the area of study. The results obtained are the used in further discussion. Based on the results the highest mean concentration of SO_2 is in Kelang with a mean concentration of 8.419µg/m3. The highest concentration for SO_2 is also found in the month of May and June. Next, Petaling Jaya holds the highest concentration for NO_2 which is 56.516 µg/m3. As for the O_3 gas the highest concentration is from Shah Alam with a concentration of 76.645 µg/m3 which are mostly the highest in the month of March. Whereas for CO and PM_{10} the highest concentration is recorded in Kelang with the highest concentration for CO and PM_{10} is 2.521 µg/m3 and 147.767 µg/m3 respectively.

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CHAPTER ONE
INTRODUCTION

1.1 Summary

As a summary for this research the five types of pollutants that will be studied on their dispersion is SO_2, NO_2, PM_{10}, CO and O_3. These five type of pollutants have different sources of emission for instance SO_2 is produced due to the emission from industrial activities but mainly it is emitted due to the emission from the power plants which uses fossil fuel. For NO_2 the main source of its emission is from the combustion process that takes places in motor vehicles which utilizes the ambient air. The main source of emission for PM_{10} which are emitted directly into the air comes from roads which are unpaved, areas of constructions and also from smokestacks, however it is also emitted as a result from the chemical reaction by SO_2 or SOx. Whereas for CO the main source of its emission comes from the incomplete combustion process where there is insufficient amount of oxygen. For O_3 the main source of its emission is from chemical reaction between NOx and several volatile organic compounds (VOC). This research will also be mainly carried out in Selangor namely in these five areas which are Shah Alam, Klang, Banting, Petaling Jaya and Kuala Selangor.