Environmental Engineering and Management Journal

January 2021, Vol. 20, No. 1, 151-157
http://www.eemj.icpm.tuiasi.ro/; http://www.eemj.eu

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ATMOSPHERIC DISPERSION PREDICTING MODEL OF PM_{10} IN A GYPSUM PLANT

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Abstract

Industries are the major sources of air pollution, especially suspended particulate matter. These sources can cause adverse health effects particularly when they are located close to populated areas. The present paper addresses the prediction of the PM_{10} dispersion from Zarch Gypsum plant. A Gaussian dispersion model (AERMOD) was used for particulate matter dispersion modeling. Emission rates of PM_{10} were evaluated by emission factors and modeling tools. The AERMOD model was implemented with upper and surface meteorological data and the results were verified by the measurement data around the Gypsum plant. The predicted concentrations were considered to be in good agreement with the measured data. The values of coefficient of determination were about R^2=0.88 and RMSE=10.55 $\mu g/m^3$. Results of this study have confirmed that the AERMOD could be applied to study the predictions of PM_{10} concentration with reasonable accuracy. Furthermore, the results represent that in some areas PM_{10} concentration is higher than the standard concentration (which is 150 $\mu g/m^3$).

Keywords: AERMOD, air pollution modeling, Gaussian model, gypsum industry, PM_{10}

Received: April, 2020; Revised final: May, 2020; Accepted: June, 2020; Published in final edited form: January, 2021

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