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ATMOSPHERIC DISPERSION PREDICTING MODEL OF PM₁₀ IN GYPSUM INDUSTRY (CASE STUDY: ZARCH 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 PM₁₀ dispersion from Zarch Gypsum plant. A Gaussian dispersion model (AERMOD) was used for particulate matter dispersion modeling. Emission rates of PM₁₀ 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 R²=0.88 and RMSE=10.55 µg/m³. Results of this study have confirmed that the AERMOD could be applied to study the predictions of PM₁₀ concentration with reasonable accuracy. Furthermore, the results represent that in some areas PM₁₀ concentration is higher than 150 µg/m³ the standard concentration.

Key words: AERMOD, air pollution modeling, Gaussian model, gypsum industry, PM₁₀

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