



“Gheorghe Asachi” Technical University of Iasi, Romania



AIR POLLUTION BY HEAVY METALS FROM PETROCHEMICAL INCINERATORS: MEASUREMENT AND DISPERSION MODELLING

Akbar Pirbadali-Somarin, Seyed Mohsen Peyghambarzadeh*

Department of Chemical Engineering, Mahshahr branch, Islamic Azad University, Mahshahr, Iran

Abstract

Distribution of solid particles in the atmosphere around the pollution sources has an important role in decision making to oppose with air pollutants. This study reports the concentration and distribution of 11 heavy metals including Cu, Co, Ni, Cd, V, Ti, Mo, Cr, Pb, As, and Hg emitted from 6 incinerators (A to F) with various feeds and operating conditions to determine the extent of exposure for industrial and residential areas. These incinerators located at Petrochemical Special Economic Zone (PSEZ), Mahshahr, south-west of Iran. The concentration of pollutants for two periods of year (July 2015 and January 2016) was measured experimentally using Vapor Generation Accessory 77 (VGA77) tool according to Iso 9096 no Central Point (EPA m-29&VDI 3868). AERMOD modelling software was then implemented using some information from incinerations, five years-averaged metrological data (2010-2014), and 50×50 km topographical information. Results on the modeling for the hot and the cold seasons showed that none of the residential and urban areas are affected by the release of the heavy metals, and only a part of the PSEZ is influenced. Also, Arsenic metal is not observed in the measurement, and Chromium is the most abundant among all the emitted metals. Finally, incinerators F represents the worst condition according to its flow rate and other parameters

Key words: AERMOD, air pollutants modeling, environment protection, incinerator; solid waste

Received: May, 2019; Revised final: July, 2019; Accepted: September, 2019; Published in final edited form: March, 2020

* Author to whom all correspondence should be addressed: e-mail: peyghambarzadeh@gmail.com; Phone: +98 9123241450; Fax: +98 1133325861