

RELEASE OF PCDDS/FS: UNEP - TOOLKIT VERSUS MEASURED VALUES

Neeta Thacker^{1*}, Anbu Munusamy², S. M. Tamane¹, A. D. Bhanarkar¹ and D. D. Majumdar¹, Meeta Sharma³ and Sharandeep Singh³.

¹National Environmental Engineering Research Institute, Nehru Marg, Nagpur - 440020, India; ²National Institute for Interdisciplinary Science and Technology, Thiruvanthapuram, India; ³Central Pollution Control Board, Delhi, India.

Introduction

The UNEP TOOLKIT was used to calculate the annual dioxin (polychlorinated dibenzoparadioxins and dibenzofurans, PCDDs/Fs) release to various environmental compartments in India. The annual release of dioxins and furans calculated based on default emission factors of UNEP TOOLKIT. UNEP

TOOLKIT calculation was compared with calculation using measured emission factors.

Materials and Methods

Sampling and analysis

Samples were collected from identified potential sites of India. Solid samples were extracted using SOXHLET extraction system and wastewater samples through liquid-liquid extraction following the USEPA method 1668C. The extracted samples after clean-up and concentration were finally analyzed in HRGC/HRMS.

Results and Discussions

The annual PCDDs/Fs releases calculated using UNEP TOOLKIT was estimated at 8.66 kg TEQ for the year 2009-2010. The major contribution of PCDDs/Fs emission is from waste incineration and ferrous and non-ferrous metal production categories followed by heat and power generation

sector. Waste incineration has 66.75% share of the total annual releases. The second highest source is ferrous and non-ferrous metal production. The highest amount of PCDDs/Fs is released into residues 63.12%, followed by air emission which accounts for 32.66% of the total releases.

During the NIP preparation, samples were analyzed and measured to compare with the emission factor as provided under the UNEP TOOLKIT. Sampling and analysis of flue gases were carried out with the objective of developing measured emission factor as the incineration procedure along with the Advanced Pollution Control Systems (APCS) availability are markedly different from the case studies mentioned in the TOOLKIT. By applying measured emission factors the PCDDs/Fs releases were of the order of 11.66 kg TEQ/a. It is 35% more when compared to emission factors using the UNEP TOOLKIT. This is a very significant difference and needs further investigations. One of the reasons for the difference could be that the TOOLKIT emission factors

are derived from technologies and raw materials used in developed countries and the operations performed under rigidly controlled conditions. Interestingly the major differences were observed with productions of mineral products and chemical and consumer goods. These are the sectors where in India local technologies are prevalent.

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Reference

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