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FORMALDEHYDE: IS AN AIR CONTAMINANT IN RURAL AREA?

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ABSTRACT

Formaldehyde is ubiquitous in the environment: it is an important endogenous chemical that occurs in most life forms, including humans with an estimated Bioaccumulation Factor (BCF) of 3 calculated for formaldehyde, using a log Kow of 0.35 and a regression-derived equation. Formaldehyde's production and use in the manufacture of resins, disinfectants, preservatives, and a variety of other chemicals may result in its release to the environment through various waste streams. In the past was used also for indoor and soil sterilisation. It is formed naturally in the troposphere during the oxidation of hydrocarbons, which react with hydroxyl radicals and ozone to form formaldehyde and other aldehydes, as intermediates in a series of reactions that ultimately lead to the formation of carbon monoxide and carbon dioxide, hydrogen and water. Of the hydrocarbons found in the troposphere, methane is the single most important source of formaldehyde. Terpenes and isoprene, emitted by foliage, react with hydroxyl radicals, forming formaldehyde as an intermediate product. Formaldehyde in rural areas could be introduced in air trough natural processes or troug antreopic activities as fertilization, soil sterilisation or plastic film use (greenhouses, soil mulching, etc). The main objective of this project was to enlighten the air level of formaldehyde in rural areas where human agricultural activities could play an addictive role respect natural basal air concentration.

Nine representative sites in North Italy were selected and monitored for at least five days (eight hours each time) in different climatic conditions by drawing air through two midget impingers containing an aqueous solution of 2,4 dinitrophenylhydrazine. The derivatized formaldehyde-dinitrophenylhydrazone formed will WERE be analysed by LC-MS/MS. Sampling and analytical method for outdoor atmosphere and results of air monitoring program will be displayed and discussed.

REFERENCES

National Center for Biotechnology Information. PubChem Compound Database; CID=712, pubchem.ncbi.nlm.nih.gov/compound/712 (accessed Apr. 30, 2015).