METHYL IODIDE: A POTENTIAL ALTERNATIVE TO METHYL BROMIDE

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Methyl iodide has apparently never been tested as a soil fumigant. Methyl bromide was from the beginning a cheap, effective fumigant which out performed all alternatives. The effectiveness of methyl bromide is accepted to result from its ability to methylate sulfur, nitrogen and oxygen atoms in a wide variety of critical biochemicals in pests and pathogens. Methyl iodide is the common choice of chemists for similar methylation reactions in the laboratory because it is slightly more reactive than methyl bromide.

The major problem with the continued use of methyl bromide is its status under the U.S. Clean Air Act and the Montreal Protocol as an ozone depleting chemical with an "ozone depletion potential" (ODP) of greater than 0.2. In contrast, methyl iodide is known to undergo efficient photochemical degradation in sunlight leading to an estimated lifetime in the atmosphere of a few days. Thus it is concluded that methyl iodide should not be a significant player in the ozone depletion problem.

Methyl iodide was tested against various insects in the 1930's to the 1950's and found to be effective. Work was continued on stored products insects in India from 1974-1987. In all cases where a comparison was made, methyl iodide was more active than methyl bromide.

Methyl iodide has several advantages over methyl bromide for use as a soil fumigant:

- Photochemical degradation in sunlight, low estimated ODP
- Chemical reactivity as an alkylating agent
- Low boiling liquid (42°C) with high vapor pressure, worker safety
- Short half life in natural waters

One question which comes up frequently is, what is the status of methyl iodide relative to carcinogenicity? The short answer is that both methyl bromide and methyl iodide are listed by the International Agency for Research on Cancer (IARC) as not classifiable as to their carcinogenicity in humans.

General References -

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