

1, 2-Dimethyl-3-phenyl aziridine: An impurity in methamphetamine.

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Methamphetamine is a potent sympathomimetic amine. Its pleasant effects that lead to abusing are mood elevation, increase in wakefulness, and decrease in appetite. It is easily synthesized in clandestine laboratories. Methamphetamine can be produced from reduction of ephedrine. One of impurities reported in methamphetamine synthesized from ephedrine is 1, 2-dimethyl-3-phenyl aziridine, which comes from internal substitution of chloroephedrine. This impurity may have toxicity since there are aziridine-containing compounds that have shown diverse biological activities including alkylation of DNA and cellular macromolecules. In this presentation, cis- and trans-1, 2-dimethyl-3-phenyl aziridine were analyzed by Gas Chromatography/Mass Spectrometry. These two stereoisomeric forms of aziridine are completely separated from each other as well as from

methamphetamine and its metabolite, amphetamine. Because both isomeric forms have similar 2-dimensional molecular structure, they give similar mass spectra. The lower limit of detection of this method is 3 microgram/milliliter, which is not enough to detect these compounds in a biological specimen. To increase sensitivity, their molecules must be derivatized in order to increase their molecular weight and volatility. The results showed that during derivatization, unstable aziridine ring was opened and then reacted with surrounded water, forming ephedrine. Thus, when ephedrine is detected in a methamphetamine tablet, it may be derived from contaminated aziridine in addition from left over-ephedrine precursor or added ephedrine during packaging. It is still in doubt about the stability and toxicity of this aziridine in human body after taken.