FOURIER-TRANSFORM MICROWAVE SPECTROSCOPY OF CHEMICAL-WARFARE AGENTS AND PRECURSORS

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We are presently using Fourier-transform microwave (FTMW) spectroscopy to investigate important precursors in the synthesis of chemical-warfare agents. We are also establishing a FTMW spectroscopy facility at the Surety Laboratory at Edgewood Research and Development and Engineering Center, where capabilities exist for handling chemical-warfare agents. Here the rotational spectra of Sarin, Tabun and Mustard Gas will be studied, and tests will be undertaken to assess the potential of using FTMW spectroscopy for detecting these species in air. The extremely low vapor pressure of these agents coupled with their high toxicity complicates the experiment. The high sensitivity of this technique, combined with its excellent spectral resolution < 5 kHz, suggests that FTMW will offer unambiguous identification of chemical-warfare agents at concentrations below a part-per-million by volume in air. In addition, software and hardware advances have reduced the size and increased the rel! iability and ease of use of the instrument. An overview of the project will be given as well a brief description of the new microwave measurements on pinacolyl alcohol and thiodiglycol, both precursors in the synthesis of chemical-warfare agents.