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Title:Compact submillimeter/terahertz gas sensor with efficient gas collection, preconcentration, and ppt sensitivity
Authors:Neese, C.F. (1); Medvedev, I.R. (2); Plummer, G.M. (3); Frank, A.J. (4); Ball, C.D. (4); De Lucia, F.C. (1)
Author affiliation:(1) Dept. of Phys., Ohio State Univ., Columbus, OH, United States; (2) Dept. of Phys., Wright State Univ., Dayton, OH, United States; (3) Enthalpy Anal., Inc., Durham, NC, United States; (4) Battelle Memorial Inst., Columbus, OH, United States
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Abstract:Although heretofore unrealized, it has long been known the rotational fingerprints of gases that occupy the submillimeter/terahertz (SMM/THz) spectral region can provide a basis for analytical systems with unique gas detection, identification, and quantification capabilities. Among these capabilities are near absolute specificity, even in complex mixtures, quantitative analysis, and excellent sensitivity to small samples. This paper describes such a system, self-contained in a 1 cu. ft. package. This system combines modern SMM/THz technology, sorbents to capitalize on the small sample requirements of the spectroscopic technique, and modern computational power to use the information contained in the complex rotational fingerprints. Moreover, the system and approach described show a clear path to future sensor systems that can be even smaller and more robust, as well as very inexpensive.
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Uncontrolled terms:compact submillimeter/terahertz gas sensor - gas collection - gas preconcentration - ppt sensitivity - compact SMM-THz gas sensor - quantification capability - identification capability - complex mixture - quantitative analysis - spectroscopic technique - computational power - complex rotational fingerprint
Inspec classification codes:A8280T Chemical sensors - B7230L Chemical sensors - B7310N Microwave measurement techniques
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