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A Measurement of the Hyperpolarizability of Carbon Tetrachloride by ESHG at 614.5 nm

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The second hyperpolarizability (γ) of carbon tetrachloride was measured by gas-phase electric-field-induced second-harmonic generation (ESHG). Periodic phase matching was used in order to enhance the ESHG by gases illuminated by a cw argon-ion laser operating at 514.5 nm. Using nitrogen as a reference gas, γ_{CCl_4} can be calculated by means of the ratio $\gamma_{\text{CCl}_4}/\gamma_{\text{N}_2}$ determined to be 18.3 ± 0.7 .

Information about the Author:

Wesley Cheek is a senior physics major at VU. This past summer in an REU program, he worked under Dr. David Shelton at the University of Nevada in Las Vegas. Along with another student from UNLV, they were led to measure a non-linear optical response of gaseous CCl_4 . This project was very interesting and has made him interested in doing research in optical physics in his senior year and in graduate school.

Faculty Sponsor: Dr. David Shelton, University of Nevada-Las Vegas

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