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Probing energetics with second harmonic generation CHRISTOPHER KONEK, BRIAN MASON, CHAD STOLTZ, JARED GUMP, JOHN WILKINSON, Indian Head, Naval Surface Warfare Center, INDIAN HEAD, NAVAL SURFACE WARFARE CENTER TEAM — We focus on the insensitive high explosive 1,3,5-triamino-2,4,6- trinitrobenzene (TATB) with the goal of obtaining structural information as a function of pressure and temperature. Prior experiments from Los Alamos (Son et al. J. Phys. Chem. B. 1999, 103 (26) 5434) demonstrated that in high temperature environments (approaching 300° C) TATB increases in efficiency as a nonlinear optical medium, possibly undergoing structural changes which alter the crystal symmetry. We use the nonlinear optical technique second harmonic generation (SHG) to probe TATB in a diamond anvil cell experimental setup to perform measurements at high pressure. Additionally, by exploiting the electronic absorption features of TATB to perform resonantly enhanced second harmonic generation (RE-SHG) experiments, we probe the electronic transitions in the visible range as a function of pressure and temperature, to observe electronic changes that would occur. Polarization resolved SHG experiments allow further insight into changes in crystal structure. These static measurements may have implications for shocked TATB.

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