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Forward Stimulated Raman Scattering of aqueous solution of Ammonium Nitrate[1] PREM KIRAN PATURI, RAKESH KUMAR VADDAPALLY[2], ACRHEM, University of Hyderabad, ACRHEM TEAM — A great potential exists for stimulated Raman scattering (SRS) signals for the detection of energetic materials dissolved in liquids and laser generated shock pressure at the focal volume. When an intense picosecond laser pulse is focused into liquid medium there is generation of shock wave in the focal region. This shock wave while propagating into the medium varies the pressure and temperature of the liquid locally leading to the appearance of novel phases along with the regular Raman peaks. We present the phase changes of ammonium nitrate (AN) dissolved in water by studying the forward SRS (FSRS) signals due to propagation of 30 ps laser pulses. The dominant peak corresponding to the NO_3^- symmetric stretching mode is observed with a Raman shift of 1045 cm^{-1} which represents phase IV of AN with an orthogonal crystalline structure. Apart from this peak, the dominant mode of liquid phase of water with a Raman shift of 3400 cm^{-1} and an ice VII peak at a Raman shift of 3050 cm^{-1} confirming the pressure of 10 GPa is observed. The effect of the concentration and input laser energy on the appearance of the phases will be presented.

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