CARS STUDY OF DEUTERIUM CLUSTERS STABILIZED IN SOLID HELIUM

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By using the technique recently proposed[a] deuterium clusters have been firstly introduced into the matrix being more inert than hydrogen itself[b]. The known effect of $Q_1(1)$ line dramatic predominance over $Q_1(0)$ one turned out to be even more expressed in CARS than in common Raman scattering (RS) - being equal to 1 in a gas the ratio of probabilities for nearly pure o-D_2 crystal was found to be as high as 10,000 in stimulated RS whereas in common RS it has been known to be only 50. We have shown that the effect appears just as the phonon band is to be formed in crystallite, i.e. for the clusters contained more than 10^3 molecules. The coherent interaction of D_2 resonant line with non-resonant CARS signal from solid helium has been observed.

[a]E. B. Gordon, A. Usenko and G. Frossati *J. Low Temp. Phys.* **130**(1-2), 15, 2003

[b]E. B. Gordon, G. Frossati, A. Usenko, Y. Aratono and T. Kumada*Physica B* (in press)