OBSERVATION OF STIMULATED RAMAN SCATTERING OF LIGHT IN CRYSTALLINE POWDERS

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Submitted 3 January 1967
ZhETF Pis'ma 5, No. 6, 188-189, 15 March 1967

Stimulated Raman scattering of light (SRS) has been observed so far in transparent media. According to the prevailing opinions, it can occur only in such media. Nonetheless, we succeeded in observing SRS spectra in fine-crystal powders. We used the ordinary scheme for observing SRS. Spectra were obtained and investigated for four substances (stilbene, 4,4'-para-azoxyanisol, azoxyphenetole, anisal-para-amino-azobenzene). For all substances, the first Stokes component was observed in the spectrum. For stilbene, the first anti-Stokes component was observed. The absence of the latter for the other samples can be attributed to the presence of strong absorption in this region. In individual cases, a weak second Stokes component was observed. We note that the spectrum always revealed only one line, even after multiple laser flashes (up to 10 flashes) registered at the same spot on the photographic plate. The line obtained in this manner was greatly overexposed.

The obtained spectra were compared with the spectra of ordinary Raman scattering. The comparison has shown that the observed lines correspond to the strongest lines in the spectrum of ordinary Raman scattering (ΔV = 1593 cm^{-1} for stilbene, ΔV = 1145 cm^{-1} for anisal-para-amino-azobenzene, ΔV = 1328 cm^{-1} for azoxyphentole, and ΔV = 1280 cm^{-1} for 4,4'-para-azoxyanisol). The foregoing facts allow us to assume that the observed phenomenon is stimulated Raman scattering of light in the powder.

The possibility of observing SRS in fine-crystal substances can in all probability be explained as follows. Multiple passage of light through the individual crystallites causes the intensity of the SRS line to increase exponentially with the path length. This increase can mask the reduction in intensity due to the dispersion of the sample. It is important to note that we were unable to excite SRS in a stilbene single crystal of 10 mm thickness.

The observed SRS phenomena in powders extend greatly the number of objects for which these spectra can be obtained.

EFFECTS OF NUCLEAR AND COULMB INTERACTION OF NUCLEONS IN THE FINAL STATE IN THE CASE OF THREE PARTICLE PHOTODISINTEGRATION OF THE He^3 NUCLEUS

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Submitted 28 November 1966
ZhETF Pis'ma 5, No. 6, 189-192, 15 March 1967

In a recent article, Dzhibuti et al. [1] criticized the work reported in [2,3]. The main content of their remarks reduces to the following.