

# Concerning the letter of G. A. Askar'yan "On selective collisionless excitation and dissociation of molecules by intense infrared light"

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1. G. A. Askar'yan in 1964–1965 drew attention to the possibility of a strong radiative action of laser radiation on the vibrational degrees of freedom of molecules.

2. The effect discovered by N. Izenor in 1971 of collisionless dissociation of molecules by the intense field of the radiation from a CO<sub>2</sub> laser is observed only in the case of sufficiently polyatomic symmetric molecules.

3. The discussion given by G. A. Askar'yan is valid only for the description of excitation of diatomic molecules or nondegenerate vibrations of polyatomic molecules. It does not describe the excitation of molecules with degenerate vibrational modes, does not take into

account the Fermi resonances, the complicated nature of the vibrational spectrum and the existence of a quasi-continuum of excited vibrations and of its structure. Taking all these circumstances into account fundamentally alters the description of the excitation and dissociation of molecules.

4. At the same time the papers of G. A. Askar'yan and also of F. B. Bunkin (Ref. 46 in the review article in Usp. Fiz. Nauk 118, 583 (1976) [Sov. Phys. Usp. 19, 285 (1976)]) are the first publications devoted to the radiative action of intense laser radiation on molecules and as such should be cited.

Translated by G. Volkoff