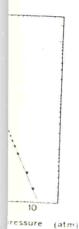
IN HELIUM

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(atm)

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ressures ranging from 1 to 41 atm, in mixwith: N2, O2, CO, CO2, NO, N2O. The gentrends are: a) the spectral distribution corands to vibrational bands of the molecular of the impurity, b) the amplitude of the light is nearly independent from the impurity vessure until quenching values are reached, c) amplitude is independent from the He presexcept for N2 and CO mixtures, for which sinversely proportional to this pressure, d) the time depends only from the partial presare of the impurity, and is inversely proportioto this pressure (times of the order of 15 . 10 μsec at 10-3 Torr). At low concentrations decay time due to impurity may be much longof that of u.v. emission. This fact means that energy source for impurity excitation is diferent from that of u.v. radiation. Are so exclud-Pennig effects on impurity molecules produced He atoms in metastable states. Taking also inaccount that the energy expended in ionization mainly in He[†] states, the most probable meanism is the charge exchange: $\text{He}_2^+ + \text{M} \rightarrow 2\text{He} + \text{M}^{+\text{V}} \rightarrow 2\text{He} + \text{M}^+ + h\nu$; where $\text{M}^{+\text{V}}$ is the moledar ion of the impurity in a vibrational excited te. This mechanism was suggested by Bennet

[3] for He-N₂ mixture at 350 Torr. The maximum energy available for transfer in He₂, in its higher excited states is about 20.5 eV. A degree of vibrational excitation of He₂⁺ ions, depending on the pressure, might show up through a variation of the yield of the impurity ions, when the energy required to produce the appropriate state is near to 20 eV. This is the case of the B² Σ ⁺ states in N₂⁺ and CO⁺ (18.8 and 19.7 eV respectively). The cross sections for the charge exchange deduced from the time dependence (point d), are of the order of 10-14 cm². The experimental data on helium mixtures will be given in a more detailed paper.

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PHONON DISPERSION MEASUREMENTS ON AN ARGON SINGLE CRYSTAL AT 4.2°K

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Received 18 November 1968

Phonon dispersion measurements by inelastic neutron scattering on an argon single crystal at helium temperature have been performed.

A single crystal of Ar of about 45 cm³ volume in fcc structure has been grown from Ar with natural isotopic mixture ($\sigma_{coh} = 0.40$ barn, $\sigma_{coh} = 0.25$ barn) and an impurity concentration from. The growing technique, including handland testing of the crystal, has already been wribed [1]. The specimen was mounted in a

cryostat such that it was completely surrounded by aluminium walls and could be cooled to liquid helium temperature.

The neutron measurements were performed with the triple axis spectrometer at the FRJ-2 reaction in Jülich. The cryostat was mounted on a special goniometer for orientation of the sample