

interpretation of this as a singlet transition excited by the 3650 mercury line would give a scattering frequency of 3328 cm^{-1} . It is possible that this corresponds with Rao's reported 3319 cm^{-1} transition which he attributed to the HNO_3 molecule.

The variation of the intensity of the lines with dilution is clear cut and is believed to be the second optical indication of the formation of different molecular or ionic species by the dilution of strong acids. The first was obtained years ago by Pfund (*Astrophys. J.* **24**, 19 (1906)), who observed differences in the infra-red frequencies, reflected from surfaces of fuming and dilute sulphuric acid. The

effect undoubtedly affords a new probe into the processes of dissociation in solution and will be particularly useful in cases where the strong absorption of water makes the solution opaque to the infra-red. The Raman work is being extended to salts, other acids and electrolytes, and in collaboration with Professor Ellis the infra-red absorption spectra, as a function of concentration, are being studied.

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January 16, 1930.

Note on Electron Scattering in Atomic and Molecular Hydrogen

The theoretical scattering formula in the paper on Electron Scattering in Atomic and Molecular Hydrogen in the Physical Review of September 1st, 1929, refers to the number of electrons scattered between the angles θ and $\theta+d\theta$, whereas the experimental points represent the scattering in the solid angle between θ and $\theta+d\theta$. In order to make the experimental points refer to the quantity given by the theoretical formula they must be divided by a factor proportional to the sine of θ . When this is done to the results for inelastic scattering the points are in much better agreement with the theoretical curve. But when the proper correction is applied to the results for elastic scattering the agreement with the theoretical curve is not as good as that given in the paper. The departure from

the curve at small angles is probably due to the influence of adsorbed gas on the slits of the apparatus. Some evidence of this was found during the experimental work but it was not a factor which could be accurately determined and corrected for. It would be of about the right amount to account for the observed departure at small angles. At large angles the observed scattering would differ from that predicted by the formula. The explanation of this effect is not clear, unless it is due to the scattering from molecular hydrogen. It is hoped to obtain further information on these points with an apparatus of different design.

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January 14, 1930.

Evidence of the Presence of Element 87 in Samples of Pollucite and Lepidolite Ores

Element 87 is peculiarly well placed in the periodic table for detection by a new and very sensitive method recently reported by us. (*Phys. Rev.* **35**, 124 (1930).) We have accordingly made a search for this element in samples of pollucite and lepidolite ores supplied by the Research Laboratory of the General Electric Company, and we have consistently found minima at points of the scale which correspond to an element of the atomic weight and the valence ascribed to eka-caesium. We have studied the substance in the chloride, sulphate, nitrate and hydroxide compounds, in each case finding the minima at points of the scale characteristic of an element of the chemical equivalent of eka-caesium. Since the same element in different compounds produces its character-

istic minima of light at different points of the scale, the fact that minima are observed in each of the four compounds at the points appropriate to element 87 affords evidence of considerable weight for its presence in the sample under test. The element appears to have several isotopes, as judged by the number of its characteristic minima. The method employed is sufficiently delicate to detect less than one part of a compound in 10^{10} parts of water. The work is still in progress.

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January 11, 1930.