

Letters to the Editor.

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The Spectrum of SiF.

IN connection with a forthcoming paper by us on the bond energies of molecules, we found that the existing analysis of SiF bands was by no means complete and satisfactory.¹ We have therefore revised the vibrational analysis of the β -bands and of the α -bands, and added an analysis of the γ -bands. The β -bands can now be ascribed to ${}^2\Sigma \rightarrow {}^2\Pi$, the α -bands to ${}^2\Pi \rightarrow {}^2\Pi$ and the γ -bands to another ${}^2\Sigma \rightarrow {}^2\Pi$ transitions. All these transitions involve the same ${}^2\Pi$ lower level which is also the ground state of the molecule. The constants of the molecule in its various electronic states are:—

Term	ν_0 (cm. ⁻¹)	ω_0	$\omega_0 x_0$	D (Volts)
X ${}^2\Sigma$	0 161.1	852.0	4.7	4.77
A ${}^2\Pi$	23573.9 448.4	674.4	6.9	2.04
B ${}^2\Sigma$	34716.6	1006.4	4.8	6.51
C ${}^2\Sigma$	39531.5	885.5	6.2	3.90

A detailed report of the analysis and the structure of the molecule will be published elsewhere.

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¹ Cf. Jevons: *Report*.

Hydration and Change in Water Equilibrium in Electrolytic Solutions.

IN continuation of my previous work¹ on the subject, the three strong electrolytes, sodium nitrate, sulphuric and hydrochloric acids, are now studied in their aqueous solutions along with the pure solvent in each case under identical experimental conditions and with times of exposure varying inversely as the quantity of water contained in equal volumes of the solution and the pure solvent with a view to quantitatively estimate the changes that take place in the constitution of water *as solvent* as compared with that of the pure liquid.

It has been found from my earlier investigations that the influence of strong electrolytes on the constitution of water is to shift the water equilibrium between mono-, di- and tri-hydrol as could be inferred from a detailed study of the structure of the Raman water-band in their aqueous solutions. Further, in most of them, the observed effect has been noticed to be complicated by the presence of hydration, which has been found to be least prominent in the case of sodium nitrate. The influence of mono-, di- and tri- or more complex hydrates on the structure of the Raman water-band has been shown elsewhere² to be to intensify approximately the corresponding components of the water-band due to the single, double and triple molecules of water. With a view to supplement the qualitative results hitherto obtained in a number of substances, a quantitative study of some of them is undertaken in the present investigation.