

A NEW ($2 \rightarrow 2$) BAND IN THE SPECTRUM OF THE OD MOLECULE

IN an attempt to search for OD in the solar spectrum, photographs have been obtained of the band $\lambda 3065$ and the adjacent regions with different exposures. The spectrum in this region consists of a number of overlapping bands which degrade to the red. The $\Delta v = 0$ sequence lies mostly in this region, the origin of the ($0 \rightarrow 0$) band falling within a few wave numbers of that of the corresponding OH band. The high initial purity of the sample of heavy water produced a spectrum entirely free from any trace of OH bands. The method of excitation was similar to that described by Rao and Sastry¹ and the same spectrograph was employed for photographing the spectrum. With this type of discharge tube the background radiation was greatly reduced.

Precision measures of wave-lengths of about 200 lines in the region between $\lambda 3100-3250$ have been made. Among these are about 90 lines which form the six principal branches of a new ($2 \rightarrow 2$) band. The relative intensities of the lines in the several branches of this band have been studied from microphotometric traces. The rotational term differences obtained from these branches are used to evaluate the molecular constants. The agreement between these and similar values derived by Rao and Sastry from the ($2 \rightarrow 1$) and ($3 \rightarrow 2$) bands justifies the quantum assignment.

A study of the lines of the ($0 \rightarrow 0$), ($1 \rightarrow 1$), and ($2 \rightarrow 2$) bands for possible solar correlations has been made. A complete description of this work will be published shortly.

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¹ Rao and Sastry, *Curr. Sci.*, 1940, 9, 225.

A NOTE ON COAGULATION OF COLLOIDS BY BI-METALLIC JUNCTIONS

WHEN a potential is established colloid particles migrate and flocculate at the poles. Even

a slight potential is considered sufficient. In the present experiments the effect of bi-metallic junctions on coagulation of colloids have been studied.

An iron-aluminium couple was prepared by dipping a freshly cleaned piece of aluminium foil in a warm concentrated solution of ferric chloride. An adherent deposit of iron on the aluminium surface was obtained if the replacement was not allowed to proceed too far. The couple was washed completely free from all adhering electrolytes and then introduced into an arsenic sulphide sol. A remarkably rapid coagulation of the sol was observed. The coagulation always proceeded from certain active points on the couple and soon definite streaks of coagulated particles became visible. In fact coagulation occurs most at the points where the active hydrogen is most vigorously evolved. A number of different colloidal solutions have been studied with various couples. Nearly all negatively charged sols are rapidly coagulated.

A detailed study has shown that the coagulation is not entirely due to the electrical potential. The experiments of Biltz¹ have been repeated and it has been found that definite quantities of metallic ions are generated by dissolution of the metal electrodes in the slightly acid medium of the sol. The flocculation of sols by couples, as described here, is largely due to electrolyte coagulation. During the coagulation of an arsenic sulphide sol by the iron-aluminium couple, definite tests for aluminium were obtained in the fluid of the colloid.

The peculiar feature of this method of coagulation, however, is that the disturbing influence of the conjugate ion which is unavoidable during electrolyte coagulation, is largely absent. This process thus affords a truer method of studying the Schultz-Hardy law for coagulation by metallic ions. A detailed report will be published soon.

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¹ *Zeitt. Electrochem.*, 1908, 14, 567.