

that the above-mentioned phenomena were caused by occasional overlapping of emission lines, and the said overlapping could not be recognised on account of the lines in the region of long wave-lengths being broad and the dispersion small. It is now evident that this edge is only due to the emulsion of different photographic plates, and it belongs to the $L_{II, III}$ -absorption edge of K (from potassium bromide), giving for L_{III} the calculated value $\nu/R = 21.5$. One of the plates of this edge, made on Eastman-Kodak plate, shows (in the first and second orders) a clear potassium edge appearing as a broad white line. The appearance of this edge as a white line is caused through the simultaneous occurrence of the normal edge of carbon with the said reversed edge, as seen in Fig. 1. The value given above has been measured from other plates with greater dispersion, with copper and tungsten anticathodes, giving sharper reference lines.

With these results, obtained with the low tension ionic tube³, the existence of the reversed absorption edges in this region is verified.

M. BAČKOVSKÝ.
V. DOLEJŠEK.

Spectroscopical Institute,
Charles University,
Prague.
Sept. 28.

¹ M. Siegbahn, *Z. Phys.*, **67**, 567; 1931.

² V. Dolejšek and B. Janíček, *NATURE*, **132**, 443; 1933.

³ V. Dolejšek and V. Kunzl, *C.J.M.F.*, **6**, 242; 1932. *Z. Phys.*, **74**, 565; 1932.

Reactions of Sulphuryl Diamide (Sulphamide)

APART from salt formation (for example, work by F. G. Mann in 1933) only two reactions of this substance have been recorded. Traube and Reubke (1923) obtained a 5 per cent yield of a condensation product with benzaldehyde, and in 1933 I showed (with Mr. A. E. Battye) that sulphamide readily condenses with formaldehyde to give a resin-like body from which a tetramethylol derivative may be isolated.

I have now found a third 'organic' reaction for this substance, which again exhibits its great similarity with urea. If xanthidrol in alcohol is added to a solution of sulphamide in acetic acid and water, after some time, beautiful lustrous crystals of dixanthyl sulphamide, m.p. 182°-4° C., are obtained. Condensation products have also been obtained with xanthidrol and

p-aminobenzene sulphonamide, m.p. 209°
m-benzene disulphonamide, m.p. 170°
p-toluene sulphonamide, m.p. 198°.

Details will be published elsewhere of this general reaction for the sulphamides and sulphonamides, which in certain cases may be conveniently used for their estimation.

F. C. Wood.

11 Amherst Road,
Fallowfield,
Manchester.
Oct. 24.

Points from Foregoing Letters

ULTRA-RAPID photography has shown that lightning strokes consist of a 'leader' from cloud to earth and a return stroke in the opposite direction. From fluctuations in the luminosity of the return stroke at the ground end, D. J. Malan, Dr. B. F. J. Schonland and H. Collens infer that the return stroke is made up of several component discharges, the intensity and time separation of which in micro-seconds they have measured. The authors are now investigating the influence of these components upon the waveform of atmospherics radiated by the lightning flashes.

Some experiments by the late Sir John McLennan and Mr. W. H. Rann on the radioactivity produced by neutron bombardment of certain rare earths are described. They confirm earlier results of Hevesy and Levi and of Sugden and Marsh.

Finch and Quarrell suggested some time ago that the 'extra' rings obtained in electron diffraction experiments with metal foils (containing oriented crystals) were due to two-dimensional refractions at the exit crystal faces. Dr. L. H. Germer submits calculations showing that this cannot be the case. Dr. G. I. Finch agrees with Dr. Germer's findings and points out that they are consistent with the new interpretation put forward by Finch, Quarrell and Wilman, namely, that the 'extra' rings are due to surface contamination.

G. Wald finds in the light-adapted retina of the bull-frog, as in the case of other species of frogs, two substances chemically related to carotene, the yellow pigment of carrots: vitamin A (visual white), and retinene (visual yellow). In the dark, the yellow retinene changes to visual purple. Extracted retinene

is transformed on standing into vitamin A. In the intact eye vitamin A is resynthesised to visual purple.

Prof. E. S. Pearson, continuing a discussion on statistical tests, contends that all hypothetical frequency distributions are merely graduation formulae. We are never concerned with whether a hypothesis be true or false, but only with the extent to which it graduates our experience of Nature. But nevertheless, the efficiency of statistical tests can be assessed by the manner in which, on repeated application, they control certain errors of practice.

During the process of meiosis, the chromosomes carrying the inheritable characters from two parent nuclei join together, exchange certain portions, and then split (disjunction). Re-arrangement of certain portions (crossing-over) may occur. Darlington has stated that crossing-over is a necessary condition of regular chromosome splitting. Dr. S. Gershenson reports experiments with female fruit flies from which it appears that this is not the case. Dr. C. D. Darlington replies that this hypothesis applies to normal (homozygous) organisms and not to hybrids such as were necessarily used by Gershenson.

One or more eyes have been experimentally produced by G. Lopashov in *Triton teniatus* by implanting into the blastocells of early gastrula stage, dead optic vesicles from other specimens of *T. teniatus* or of axolotl.

Using the known value of the magnetic moment of the nucleus Sb^{121} , a study by Dr. J. S. Badami of the hyperfine structure of the lines of the spectrum of the doubly ionised antimony atom has led to a modification of the gross-structure analysis of the spectrum Sb^{III} .