Preparation of Lithium Alum

DURING some work on the mass susceptibility of the alums, a successful attempt was made to prepare lithium alum, despite the fact that its existence and even the probability of its existence has been repeatedly denied.

Molecular proportions of the monohydrate of lithium sulphate and the octadecahydrate of aluminium sulphate were dissolved in the minimum quantity of cold water. The solution was concentrated considerably by evaporation on a sand bath and cooled in a freezing mixture of ice and salt with vigorous stirring, when it crystallized suddenly and deposited a mass of very soft small crystals, which were filtered and dried at the pump and afterwards on porous plates. The mother liquor after a further slight concentration deposited small hard transparent crystals on keeping in the freezing mixture.

Both crops of crystal contain 49·00 per cent of water ($Li_2SO_4Al_2(SO_4)_3.24H_2O$ requires 48·93 per cent water). The crystals are isotropic, a combination of cube and octahedron. On keeping at ordinary temperature, or on warming a few degrees, they decompose and the salts dissolve in the liberated water. They are exceedingly soluble in water; they lose the whole of the water at 200° C. and swell to a bulky friable mass. The mass susceptibility is $-0{\cdot}541 \times 10^{-6}$ and molecular susceptibility -479×10^{-6}. The properties of the alum are under investigation.

JAMES F. SPENCER.
G. T. ODDIE.
(Sister Mary Cecilia, O.P.)

Bedford College,
London, N.W.1.
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Points from Foregoing Letters

DR. A. S. RUSSELL describes work which suggests that metals of the class which forms compounds with metals of the copper, iron, cobalt and nickel class may be arranged in a list analogous to the electrochemical series. Any metal in this list can displace from intermetallic combination one lower in the list.

The formation of long carbon dendrites has been observed by K. D. Luke and Drs. W. M. Madgin and H. L. Riley in the cathodic reduction of colloidal solutions of graphitic oxide. Colloidal particles of graphitic oxide are negatively charged, and the reduction occurs in spite of the strong repulsive forces which must exist in the neighbourhood of the cathode.

The large majority of the negative ions formed during electric discharge in mercury vapour, hydrogen, nitrogen and carbon dioxide, Dr. F. L. Arnot finds, do not arise by the attachment of one electron to a neutral atom, but by the attachment of two electrons to a positively charged ion. The author calculates the probability of such conversion from positive into negative ions, for the gases mentioned above, at the surface of a negatively charged nickel electrode.

From the energy of the neutrons selectively captured by rhodium, Drs. P. Preiswerk and H. von Halban, jun., deduce the distance, breadth and form of the nuclear levels in that element. The data required were obtained by determining the absorption coefficient for each additional layer of rhodium.

Light falling upon a cuprite crystal in contact with two electrodes through which an alternating current is passing, produces an additional direct voltage. Dr. G. Groetzinger and J. Lichtschein submit curves showing how the resulting direct voltage varies with the alternating current, and its relation to the crystal photo-electric effect. They consider that this additional current is connected with events taking place in the interior of the crystal.

Experiments on mice carried out by H. Burrows indicate that progesterone, a substance related to the male sex-hormone testosterone, can protect the genital organs of the non-castrated animals from the injurious effects of large doses of the female sex-hormone, œstrone.

An increased excretion of the yellow pigments, flavins, in the urine, after eating cooked ox-liver, is reported by A. Emmerie.

From the rate of sedimentation and the movement in an electric field (electrophoresis) of the protein particles from horse serum carrying an anti-body, Prof. M. Heidelberger, Kai O. Pedersen and Arne Tiselius conclude that the particles are of uniform size and possibly a definite chemical compound. The sedimentation constant is $17{\cdot}2 \times 10^{-13}$, and the anti-body is apparently formed from a heavier minor component of the protein. The rabbit anti-body against crystalline egg-albumin, on the other hand, is produced from the principal globulin component.

Two unusual modifications of eye colour in the fruit fly, under X-ray irradiation, are reported by Dr. E. V. Enzmann and C. P. Haskins. In one case the change was from white to red, involving apparently a reverse genovariation; in the second case mutations in a culture of eosin *Drosophila* produced eye colour considerably darker than eosin, showing that wild-type condition is not necessarily the end-point of change from light to darker shades.

In the centre of a 'depression', in the later stages of its existence, the air at a height of 4–9 km., though colder and therefore heavier than surrounding layers, is nevertheless ascending. The energy needed to lift it, Dr. A. H. R. Goldie suggests, is provided by the winds, which give up part of their energy and slow down as they converge spirally towards the centre of the depression.

The propagation of voltage impulses in long discharge tubes has been investigated by Dr. L. B. Snoddy, Prof. J. W. Beams, W. T. Ham, jun., and H. Trotter, jun. The tube was found to be an excellent transmission line for high-voltage impulses. The velocity of propagation was easily controllable over quite wide ranges of the order of 10^8–10^9 cm. per sec.

A broadening of the resonance lines in the extreme red of the absorption spectrum of potassium vapour in the presence of hydrogen gas is described by T. Okuda, who considers it due to the polarization of the molecules.

ERRATUM. Dr. C. H. Douglas Clark, referring to the paragraph in this column (July 18) on his letter "Optical Polarization Ellipsoids of the Hydrogen Halide Gases", states that it is the polarizability along the long axis which is equal to that of the corresponding negative ion.