ABSTRACTS OF MINERALOGIC LITERATURE

We print herewith a number of abstracts of articles on crystal structure, etc., which appeared during 1916–17, but have heretofore been overlooked in one way or another. Their inclusion at this late date is due to our purpose to make this department a complete record of all publications bearing upon every phase of mineralogy.

A CRITICAL TEST OF THE CRYSTALLOGRAPHIC LAW OF VALENCY VOLUMES; THE CRYSTALLINE STRUCTURE OF THE ALKALINE SULFATES. A. Ogg and F. L. Hopwood. *Phil. Mag.*, **32**, 518–525, 1916.

The distances between (100) planes, as measured by the Bragg X-ray spectrometer method, is for K_2SO_4, 5.73 x 10^{-8} cm., and the volume of the unit cell is accordingly 425 x 10^{-24} cu. cm. The corresponding volumes for Rb_2SO_4, $(NH_4)_2SO_4$ and Cs_2SO_4 are 481, 485, and 555 x 10^{-24} cu. cm. respectively. The 5 atoms of each NH_4 group, total valence 9, therefore occupy only about as much space as a single Rb atom with a valence of 1, which is evidence against the validity of the Barlow-Pope "law of valency volumes." E. T. W.

X-RAY ANALYSIS AND TOPIC AXES OF THE ALKALI SULFATES AND THEIR BEARING ON THE THEORY OF VALENCY VOLUMES. A. E. H. Tutton. *Proc. Royal Soc.*, A, **93**, 72–89, 1917.

The work described in preceding abstract is discussed, and other evidence opposed to the valency-volume theory is summarized. E. T. W.

GRATING-SPACE IN HALITE AND SYLVITE CRYSTALS AND ACCURATE DETERMINATION OF X-RAY WAVE-LENGTHS. E. Wagner. *Ann. Physik*, **49**, 625–647, 1916; thru *Chem. Abstr.*, **11**, 2303, 1917.

The probable errors in the methods of determining these factors are discussed, and the best values are concluded to be: halite, $d_{100} = 2.814$, sylvite, $d_{100} = 3.136$, both times 10^{-8} cm. E. T. W.

ROENTGENOGRAMS OF CRYSTAL TWINS. A. van der Veen. *Chem. Weekblad*, **14**, 488–491, 1917; thru *Chem. Abstr.* **11**, 2637, 1917.

The photographs obtained by the Laue method with twinned crystals are discussed. E. T. W.

INTERFERENCES IN IRREGULARLY ORIENTED PARTICLES IN ROENTGEN LIGHT. P. Debye and P. Scherrer. *Physik. Z.*, **17**, 277–283, 1916; thru *Chem. Abstr.*, **11**, 1786, 1917.

Apparently an independent development of the same method of X-ray crystal analysis worked out by Hull (see abstract in *Am. Min.*, **3**, (6), 146, 1918). The interference phenomena and the inferred structures are given for lithium fluoride, so-called amorphous silicon, and graphite. The first has the same structure as NaCl. The silicon is crystalline, and has the same structure as diamond. The graphite is trigonal and appears to have 12 atoms in the unit cell. It is possible in this way to distinguish between supposed amorphous substances which are really crypto-crystalline, and truly amorphous ones. E. T. W.

X-RAYS AND THE STRUCTURE OF CRYSTALLIZED AND AMORPHOUS CARBON. ANONYMOUS. *Engineering*, **104**, 594–596, 1917.

A summary of the work of Debye and Scherrer on this subject. Amorphous carbon appears to be identical with finely divided graphite, the unit cell of the space-lattice in both cases containing 8 atoms arranged in parallel layers at distances of 3.4×10^{-8} cm. Compare preceding abstract. E. T. W.

THE PROBABLE ATOMIC CHANGES OF BISMUTH DURING A REARRANGEMENT. A. JOHNSEN. *Centr. Min. Geol.*, **1916**, 385–392; thru *Chem. Abstr.*, **11**, 1777, 1917.

The rhombohedral crystals of bismuth are believed to contain Bi_2 groups. In solutions in other metals and in vapor form the molecule varies from Bi_2 to Bi_1. E. T. W.

THE NATURAL FREQUENCIES OF SULFATES AND CARBONATES FOR INFRA-RED RADIATION OF SHORT WAVE LENGTH. C. SCHAEFER AND M. SCHUBERT. *Ann. Physik*, **50**, 283–338, 1916; thru *Chem. Abstr.*, **11**, 913–914, 1917.

A number of minerals have been studied with infra-red rays, and it has been found possible to throw some light on their atomic structure by the spectra produced. E. T. W.

THE OPTICAL BEHAVIOR OF WATER OF HYDRATION. C. SCHAEFER AND M. SCHUBERT. *Ann. Physik*, **50**, 339–345, 1916; thru *Chem. Abstr.*, **11**, 914, 1917.

From a study of the reflection of infra-red rays by water of hydration in crystals it is shown that the water occupies positions corresponding to the symmetry, and is uniaxial or biaxial like the crystal as a whole. The location of the water molecules in the space lattices can be determined thus. E. T. W.

OPTICAL OBSERVATIONS ON QUARTZ. T. LIEBISCH. *Sitzb. kgl. preuss. Akad.*, **1916**, 870–874; thru *Chem. Abstr.*, **12**, 22, 1918.

The interference figures obtained by varying superposition of a large number of plates of right- and left-handed quartz are described. E. T. W.

CRYSTAL STRUCTURE. A. SCHÖNFLIES. *Z. Kryst. Min.*, **54**, 545–569, 1915; **55**, 321–352, 1916; thru *J. Chem. Soc.*, **112**, ii, 447, 1917.

An elaborate discussion of the bearing of Bragg's results on theories of crystal structure. The relations between point-systems and space-filling are specially considered, and it is pointed out that in a chemical compound each fundamental space unit must contain one point of each point-system present. Some of the structures worked out by Bragg could have been predicted on this basis. E. T. W.

DIFFERENTIATION OF THE INTERNAL STRUCTURE OF THE DIFFERENT SPECIES OF SILICA BY THEIR ROENTGEN-RAY INTERFERENCE PATTERNS. S. KYROPOULOS. *Z. anorg. allgem. Chem.*, **99**, 197–200, 1917; thru *J. Chem. Soc.*, **112**, ii, 468.

The various forms of silica were powdered and studied by the Debye-Scherrer method (abstract above). The patterns from quartz and cristobalite are readily distinguishable, quartz glass and pptd. silica give no rings, silica gel a single broad ring. After heating silica gel to 1300° rings appear, showing partial conversion to cristobalite. E. T. W.