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with water, they must of necessity be greater than those accompanying the mixture of salt solutions.

My experiments show that—

(1.) When two salt solutions, which cannot experience double decomposition, are mixed, a change of volume takes place, due to the different affinities of the salts for water.

(2.) That double decomposition takes place in solution, and that the volume-change is an index and even a measure of this.

I hope soon to be able to lay before the Society a more extended series of experiments on this subject.

XIX.—*Two New Aluminous Mineral Species, Evigtokite and Liskeardite.*

By WALTER FLIGHT, D.Sc., F.G.S., of the Department of Mineralogy,
British Museum, South Kensington.

Evigtokite.

THIS mineral, described as “fluoride of aluminium,” and obtained from the cryolite bed of Greenland, was bought in June, 1861, of Mr. Taylor; it came, together with eudialyte, arfvedsonite, columbite, black cryolite, fergusonite, sapphirine, garnet, allanite, &c., all from that locality. The whole mass consists of the same mineral, unaccompanied by any associated minerals; it is made up of a congeries of minute white transparent crystals, mostly broken up, and lying entangled amongst each other in every sort of direction, which gives the mass an appearance of opacity much resembling that of kaolin or chalk. The hardness is very low; particles are easily detached or broken in twain between the fingers.

When the mineral is heated in a glass tube, water is given off, and then hydrofluoric acid, with a strong acid reaction; the mineral does not melt. It was pounded and dried over sulphuric acid, and was found to have the following composition, when the loss in weight is taken to be water:—

	Equivalents.
Aluminium .. 16.23; with fluorine 33.64 = 49.87	.. 0.59
Calcium 22.39; ,, ,, 21.27 = 43.66	.. 1.12
Sodium 0.43; ,, ,, 0.33 = 0.76	
	94.29
Water	5.71 .. 0.63
	100.00

These numbers, it will be seen, correspond closely with the formula—



The question suggests itself, may this body have been produced by the action of water containing lime sulphate on cryolite ?

No mineral described in Dana's *A System of Mineralogy*, and its several appendices, or in the recent paper of Josef Brandl (*Annalen*, Band 213), on the composition of minerals of the cryolite group, corresponds with this mineral in composition, and I have therefore proposed to give it the name which stands at the head of this note.

Liskeardite.

To Mr. Richard Talling, of Lostwithiel, Cornwall, who has added so many new British species to the collection, belongs the honour of having noticed this mineral in 1874. At a later date, in 1877, some further specimens were sent to the British Museum, by Mr. Barnett, of Chyandour, near Penzance. It is a white crystalline mineral, with a slight tint of blue or greenish-blue, and occurs as a layer, sometimes a quarter of an inch thick, generally of a uniform fibrous structure, lining hollows or encasing quartz and other minerals. It is associated with earthy chlorite and quartz, iron pyrites, some copper pyrites and mispickel being disseminated in the lode material. Scorodite, in boss-like aggregations also occurs with it, and in at least one instance the interior of the bosses of scorodite is filled with the mineral in question.

An analysis of this mineral, made in 1878, showed it to have the following composition :—

Ferric oxide	7.640	
Alumina	28.229	
Arsenic oxide	26.962	
Sulphuric oxide	1.111	
Copper oxide.....	1.027	
Lime	0.719	
Water at ordinary temp. . .	4.351	
" 100°	10.962	(six equivalents)
" 120°	5.551	(three equivalents)
" 140—190°.....	8.220	} 34.053
" with lead oxide ..	4.969	
	<hr/>	
	99.741	

These numbers correspond with the formula—



when R represents aluminium, with a notable quantity of iron. The tint of the mineral seems to be due to the presence of about 1 per cent. of copper oxide, and a small amount of a sulphate is also present. The presence of the sulphate and the general character of the composition would lead one to place the mineral with pitticite, or "eisansinter," but the formula is so nearly that of an arsenical, instead of a phosphatic evansite, that the true place of the mineral seems to be near the evansite of the late Mr. D. Forbes.

It seemed desirable to redetermine the amount of water which left the mineral at the several temperatures: this was done with great care, and with the following results:—

It lost in a vacuum, over sulphuric acid, at ordinary temperatures, 4.722 per cent., or *four* atoms of water.

It lost, at 100°, altogether 11.266 per cent., which is about *eight* atoms of water.

It lost between 100° and 120° altogether 4.392 per cent., or *four* atoms of water.

It lost between 120° and 144° altogether 3.435 per cent., or *three* atoms of water.

It lost between 145° and 160° altogether 2.448 per cent., or *two* atoms of water.

It lost between 160° and 190°, altogether 2.351 per cent., or *two* atoms of water.

The mineral was then heated with an excess of pure lead oxide in a current of dry air, and the water collected in a calcium chloride tube. The number obtained was a further loss of 4.896 per cent., or *four* more atoms of water.

XX.—On the Absorption of Weak Reagents by Cotton, Silk, and Wool.

By EDMUND J. MILLS, D.Sc., F.R.S., and JOKICHI TAKAMINE, of the Imperial College of Engineering, Tokio, Japan.

COTTON, silk, and wool are definite chemical substances, whose composition is represented by the formulæ $C_6H_{10}O_5$, $C_{24}H_{38}N_8O_6$, and $C_{42}H_{137}N_8SO_{15}$ * respectively. It has long been known that they are capable of absorbing from weak aqueous solutions the ordinary acid and alkaline reagents.

* This expression has been calculated by ourselves from the summary of analyses in *Gmelin's Handbook*, 18, 351.