Analysis of beaumontite

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is of a bright red colour, and its specific gravity is 1.1611. When inclosed in a tube hermetically sealed, it is not decolorized by long-continued exposure to the solar rays, and it possesses all the other known properties of aqua-regia.

Chlorazotic acid gas attacks several metals, such as gold and platinum; arsenic and antimony, reduced to powder, when thrown into it, burn with the extrication of light; but it is a singular circumstance, that it has scarcely any action on phosphorus, even when melted by heat; the active product of aqua-regia does combine directly with metallic oxides; it gives a chloride and a nitrate by a reaction which is readily explained. When chlorazotic acid gas is exposed in small tubes to the cold of a mixture of common salt and ice, it liquefies, and the fluid yielded has the following properties: it is of a deep red colour, but much less so than hypochlorous acid; it boils at about 20° F.*; its specific gravity at 46° F. is 1.3677; the specific gravity of the gas is about 2.49. This liquefied gas attacks all metals which are brought into contact with it; with pulverulent silver, derived from the reduction of the chloride, it explodes, and disappears immediately; it evaporates without acting upon phosphorus.

By analysis chlorazotic acid gas appears to be formed of

Equivs.		
Chlorine.....	65.0	 2 = 72
Oxygen.....	22.4	 3 = 24
Azote.....	12.6	 1 = 14
<hr/>		
100.0 Equivalent 110		

The composition of this product may, according to M. Baudrimont, be represented by a formula resembling that of anhydrous nitric acid, for AzO_3O_2 resembles AzO_3Cl_3 ; this being the case, and considering the previous discovery of chloro-sulphuric acid, M. Baudrimont proposes to call the gas of aqua-regia *chlorazotic acid*, although in reality it is not an acid, since it does not saturate bases: 1 equivalent of chlorazotic acid corresponds to 6 volumes of vapour.

The liquefaction of chlorazotic acid, the boiling point of the liquefied gas, its direct solubility in water, its action on metallic oxides, evidently indicate that it is a substance of a peculiar and well-defined nature, and that its composition corresponds to that of anhydrous nitric acid.—*Journ. de Pharm. et de Chim.*, Janvier 1844.

ANALYSIS OF BEAUMONTITE. BY MONS. A. DELESSE.

M. Lévy has given, in honour of M. Elie de Beaumont, the name of beaumontite to a very rare mineral found in the United States; it crystallizes in the form of a right prism with a square base; the prism is terminated by a four-sided pyramid, forming with the lateral faces an angle of 130° 20'.

Two varieties of beaumontite are usually met with in mineralogical collections; one of these is of a fine honey-yellow colour, the other of a pale yellow; both of them are found in a quartzose rock

* There must be some error in the statement made as to its boiling point, or as to that at which its density is taken.—EDIT.

with haydenite, which constitutes a large portion of the rock, iron pyrites, brilliant black rhombic crystals of carbonate of iron, sometimes with green hornblende or white stilbite, possessing the usual form of the crystals of stilbite.

The density of beaumontite was found to be 2·24, which is very near 2·25, that of epistilbite; when heated in a glass tube it yields water, becomes white, swells much, and becomes powdery; on the platina wire it produces a white opalescent pearl; with salt of phosphorus it fuses readily into a glass, in which a skeleton of silica floats, and which indicates a little iron; with carbonate of soda lively effervescence ensues, and the fusion becomes perfect.

Beaumontite resists the action of acids, which appears to be inconsistent with its characters before the blowpipe, they being those of the zeolites; thus it is not acted upon by dilute nitric acid, and it is with difficulty attacked either by hydrochloric or sulphuric acid after calcination. When, however, it is reduced to a very fine powder, and treated before calcination with concentrated hydrochloric acid, it is completely decomposed, and the silica is separated in a granular state.

The qualitative examination proved that the mineral contains water, silica, alumina, oxide of iron, lime, magnesia, and a little soda; sulphur, which might be suspected on account of the pyrites, was sought for in vain.

The honey-yellow variety was selected for quantitative analysis; appeared to contain more lime than the greenish yellow, in which it is replaced by magnesia; as this mineral becomes perfectly white by calcination, it is easy to remove by this operation any small portions of foreign matter which may have escaped the first trial; the calcined mineral was first subjected with carbonate of barytes to the heat of a forge; the silica was determined in the usual way, and dissolved totally in potash; the alumina, precipitated by ammonia after adding the hydrochlorate, was afterwards dissolved in potash; the portion of the precipitate which was insoluble was treated with dilute sulphuric acid; the oxide of iron was precipitated by ammonia, and the mother-water, containing a little magnesia, was set aside. The lime was precipitated in the state of oxalate, and the sulphates were converted into carbonates by means of the acetate of barytes; on treatment with water the magnesia remained, and by evaporation traces of carbonate of soda were obtained. The insoluble portion, containing the magnesia, was treated with dilute sulphuric acid, and the solution added to the mother-water containing magnesia, the total quantity of which was determined in the state of phosphate.

The results of the analysis were—

Silica	64·2
Alumina	14·1
Lime	4·8
Magnesia	1·7
Protoxide of iron, .	1·2
Water	13·4
Soda and loss	·6

100·

It appears from this analysis that beaumontite should be classed with the zeolites, and that it contains more silica than any one hitherto described; it is undoubtedly to this circumstance that its resistance to acids is owing, and also its hardness, which is nearly equal to that of phosphate of lime.—*Ann. de Ch. et de Phys.*, Decembre 1843.

DESCRIPTION AND ANALYSIS OF SISMONDINE (A NEW MINERAL).

BY M. A. DELESSE.

This substance is found at St. Marcel, and the name was given to it in honour of M. Sismonda, Professor in the University of Turin, and author of the geological map of Piedmont.

Its characters are, that it is of a deep green colour, possessing much splendour, it cleaves readily and reflects the light brilliantly; it is brittle and easily powdered, the colour of the powder is a bright grayish green. It does not affect the magnet, either before or after calcination. It scratches glass, but is scratched by steel; its density is 3.565; the crystalline form of this mineral could not be determined.

This mineral occurs imbedded in a kind of slaty chlorite, and is accompanied with red dodecahedral garnets and titaniferous iron, the fracture of which resembles plumbago, and the powder is perfectly black.

When heated in a glass tube sismondine yields water, but it requires to be strongly heated to produce this effect; the water is not acid, nor does it act on the tube. Before the blowpipe it does not fuse, but becomes of a varying tombac brown. It dissolves with the salt of phosphorus, but with difficulty; when it is powdered the solution takes place totally and readily; the pearl, which is coloured when hot, becomes colourless on cooling.

With borax the reaction of iron is evident; with soda there is lively effervescence; small white skeletons of silica float without dissolving in the interior of the pearl, which when cold is not transparent; with nitrate of cobalt a dirty gray colour is produced; when very finely levigated sismondine is completely acted upon by sulphuric, hydrochloric, and even by nitric acid, a white granular residue of silica is left, which is not dissolved by the acids; after calcination the action of the acids is not so easy.

By analysis it yielded—

Silica	24.1
Alumina	43.2
Protoxide of iron. .	23.8
Water	7.6
Oxide of titanium	trace
	<u>98.7</u>

Ann. de Ch. et de Phys., Decembre 1843.

A METEOROLOGICAL PHÆNOMENON.

About the middle of March 1843, an anthelion was observed on a cloud in the vicinity of Cork by Mr. H. Hennessy.