XXXVI. Observations on the combination of metals with sulphur

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this treatment of blue flame, and various shades of yellow, &c. with green flame. I shall only observe in the meantime, I think it very probable that the *colour* of flame, and particularly of the *lamina* or border (which in that of sulphuret of carbon is a fine blue) with its (the edge) *width*, will determine the *grade of ignition*; and it is my opinion that all flames have a decided *electrical* character, which will express their relation to the intensities of ignition.

Oxygen compressed in Newman's blowpipe and passed through the *flame of sulphuret of carbon* produces a much more *violent* heat, than when alcohol is substituted as in Dr. Marcet's experiment.

I have lately made but few experiments with the compressed gases in the blowpipe. I however repeated successfully Dr. Clarke's experiment with the *rubies*; I also fused TWO SAPPHIRES into ONE. In one instance I completely *perforated* the *stem of a tobacco-pipe*, which the jet of inflamed gases *vitriified* in its passage,—a steel *file* before it, literally, as Dr. Clarke expresses it, presents “a shower of fire.” In this experiment it is advisable to detach the bladder containing the mixed gases, lest the sparks should ignite the explosive volume.

I am respectfully, sir,

Your humble servant,

Surry Institution, Feb. 20, 1817.

J. MURRAY.

P.S. It should be stated, that when the red-hot platinum wire is introduced into a wine-glass containing sulphuret of carbon, it always kindles the fluid; but it will be seen to continue red hot between the surface of the fluid and the base of the flame.

When oil is used in the cell of the blowpipe it has this disadvantage: the ebullition is distinguished with much difficulty by the ear; but when *water* is employed, the bubbling is *very audible*,—and the latter is therefore a less equivocal index of safety. J.M.

XXXVI. *Observations on the Combination of Metals with Sulphur.* By M. A. J. FRERE DE MONTIZON*.

A PARTICULAR examination which I have made of cinnabar, leads me to suppose that this sulphuret results from the combination of a volume of mercury and another of sulphur: but in order to confirm my opinion in the most positive manner, I have endeavoured to ascertain whether this mode of composition be also that of other sulphurets.

On this subject I have had recourse to the analyses generally

* From the *Annales de Chimie, et de Physique*, for September 1816.

adopted,

adopted, and fixed my attention to these alone, as calculated to inspire more confidence in this sort of investigation.

The results which I have obtained confirmed my remark, by some thousandth parts of sulphur in 100 parts of mass. Cinnabar offers the greatest difference:—according to Berzelius I have found about a hundredth of sulphur in 100 parts in weight; and according to Seguin it is less by half a hundredth.

As my experiments on this occasion may possess some interest on account of science, I have ventured to offer the following table of sulphurets.

Sulphurets.	Authors of the Analyses.	Density of the Metals.	Quantity of Metal.		Reduction of volumes.	
			In weight Sulphur = 20.	In volume Sulphur = 10.05.	Sulphur.	Metals.
Of Mercury	Berzelius	13.599	125.5	9.227	1.	1 or 0.918
— Mercury	Seguin	13.599	131.26	9.652	1.	1 - 0.960
— Tin	Berzelius	7.291	73.5	10.081	1.	1 - 1.003
— Nickel	Proust	8.279	42.55	5.140	2.	1 - 1.002
— Arsenic	Laugier	8.308	27.62	3.324	3.	1 - 0.992
— Molybdenum	Bucholz	7.400	30.	4.034	5.	2 - 2.019
— Zinc	Gay-Lussac	6.861	41.	6.121	5.	3 - 3.043
— Cobalt	Proust	8.5384	50.	5.855	5.	3 - 2.912
— Antimony	Berzelius	6.7021	53.69	8.011	5.	4 - 3.966
— Silver	Marcet	10.4743	135.	12.889	4.	5 - 5.130
— Lead	Berzelius	11.224	129.5	11.538	7.	8 - 8.036
— Bismuth	Berzelius	9.7654	86.35	8.843	8.	7 - 7.039
— Copper	Chenevix	8.895	40.	4.497	9.	4 - 4.027
— Iron	Thenard	7.788	34.5	4.430	9.	4 - 3.967

XXXVII. Notices respecting New Books.

A DISSERTATION on Weights and Measures, and the simplest Means of revising the British System,—said to be from the pen of Dr. Gregory of Woolwich, and printed in the 17th number of the British Review,—will be published in a separate pamphlet immediately.

Early in the Spring will be published by Mr. Newman, Soho-Square, Chromatics; or An Essay on the Analogy and Harmony of Colours; containing elementary Instruction for producing Colours by Composition in all the Variety of Hues and Shades; with a new Theory of their Relations, Arrangement, and Harmony.

In this Essay the coincidences of Music will be pointed out, and the whole illustrated by coloured diagrams, &c.

Mr. Murray's Elements of Chemical Science, second edition, with