Philosophical Magazine Series 3

ISSN: 1941-5966 (Print) 1941-5974 (Online) Journal homepage: http://www.tandfonline.com/loi/tphm14

Analysis of diaspore from Siberia

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To cite this article: M.A. Damour (1846) Analysis of diaspore from Siberia, Philosophical Magazine Series 3, 28:187, 336-337, DOI: 10.1080/14786444608645090

To link to this article: http://dx.doi.org/10.1080/14786444608645090

cations to account for on the theory of undulations. But it is evident that what Prof. Challis means by aberration, is the circumstance that s_1 is displaced from s_2 through the angle which I have mentioned. Prof. Challis's reasoning, by his own confession, does not explain aberration in the sense in which I used the word; for he says that it follows from *observation* (not theory alone), that s_2 coincides with s.

LIII. *Intelligence and Miscellaneous Articles.*

ANALYSIS OF DIASPORE FROM SIBERIA.
BY M. A. DAMOUR.

THE remarkable characters of diaspore have frequently attracted the attention of mineralogists, and have been extremely well described and analysed by MM. Children, Dufrenoy, and Hess. The author observes, that he should therefore have abstained from referring to them, if he had not had occasion lately to observe a singular property of this mineral which had not been previously noticed. The diaspore is a well-known hydrate of alumina. It is shown by the experiments of M. Dufrenoy, that this mineral, even when long boiled in sulphuric acid, not only resists its action, but retains all its water. M. Damour, on repeating this experiment, obtained the same result; but he afterwards found that the diaspore, when deprived of its water by calcination, was almost totally soluble in sulphuric acid when assisted by heat.

This property is the inverse of that which chemists always observe with respect to hydrates, and in general with respect to substances which have not been calcined. In fact, the greater number of these substances lose their solubility in acids after they have been heated to redness. In this case the contrary occurs: the peculiar molecular condition of the crystallized hydrate of alumina, constituting the diaspore, appears then to be the only obstacle to the natural affinity of this hydrate for the sulphuric acid; for calcination, by destroying this arrangement of the molecules, restores the usual properties of alumina.

M. Damour took advantage of this circumstance in order to simplify the method of analysing diaspore.

The mineral was first purified by digesting it, reduced to very fine powder in dilute hydrochloric acid at a moderate heat. There was dissolved a notable quantity of oxide of iron accidentally mixed with it. The powder, after washing, was perfectly white. The proportion of water was found to be nearly similar in three different operations: to determine this the dried powder of the mineral was suffered to remain under a receiver over a stratum of pumice moistened with sulphuric acid, this powder was weighed and placed in a small covered platina crucible; in order to prevent the projection of the powdered mineral, the crucible was placed in another of the same metal; the whole being weighed, the crucibles were submitted to

the highest temperature which could be produced by the flame of an alcohol eolipyle. The crucibles were cooled in a receiver with a glass stopper, containing fragments of chloride of calcium. When perfectly cool they were again weighed, and the difference between the first weighing and that after calcination was attributed to the quantity of water disengaged, and was 14·97, 14·96, and 14·90 in three experiments.

In order to act upon the diaspore deprived of water, hydrated sulphuric acid was poured upon the mineral remaining in the crucible in which it had been calcined. The whole was heated in a sand-bath so as to volatilize the greater part of the sulphuric acid; when the matter had become of a pasty consistence, water was added, which dissolved a great quantity of sulphate of alumina; the solution was poured off, and more sulphuric acid was added, and this operation was repeated five times. The aluminous solution was filtered in order to separate a small portion of a white earthy deposit; this, which had resisted the prolonged action of sulphuric acid, still contained much alumina; when moistened with nitrate of cobalt and heated to redness, it acquired a very decided blue tint, and readily dissolved in the salt of phosphorus.

The solution of sulphate of alumina was supersaturated with carbonate of ammonia; the alumina was collected, washed and heated for a long time to strong redness. It was very white, and nitrate of cobalt gave a fine blue tint to it.

One hundred parts of diaspore yielded—

Alumina	79·91
Water	14·90
Mineral unacted upon	5·80——100·61

M. Damour admits that this analysis is superfluous after those of MM. Dufrenoy and Hess, and gives it merely to exhibit a property worthy of attention, and which had not been previously noticed with respect to any mineral whatever.—*Ann. de Ch. et de Phys.*, Mars 1846.

ON BORACIC ÆTHER.

M. Ebelmen having ascertained that boracic acid is volatilized by the vapour of water and of alcohol, succeeded in preparing, after some trials, boracic æther by the following process:—fused and finely-powdered boracic acid was put into a tubulated retort, and an equal weight of absolute alcohol was added to it. In a few minutes the temperature of the mixture became 122° Fahr., that of the atmosphere being only 64°. The retort was heated, and a thermometer placed in it showed that the liquid did not begin to boil until heated to about 203°, and its temperature continued rising from this point. At about 230° the distillation was stopped to cohobate the distilled liquid, and it was again distilled at 230°. The boracic acid swelled much during the operation, and the liquid which covered it while the distillation was going on, had completely imbibed it the following day. The distilled liquid had the slightly alliaceous smell of absolute alcohol, became very turbid on admixture with water, deposited