

There was no change in the appearance of the material after it had been heated to this temperature. It was placed, together with a dish containing water, under a bell jar, and allowed to remain for a day, when it was found to have regained very nearly its original weight (all but 0.3 per cent.). This material was then ignited; almost immediately it began to darken in colour, and soon the entire mass appeared nearly black, but with further heating the mineral became white again, and remained so on cooling. The total loss in weight was 22.61 per cent. From the change in colour it is evident that this loss is not entirely due to the water expelled, but the cause of the blackening was not determined; it is apparently a characteristic feature of all saponite. A direct determination of the water by the Penfield method gave 20.42 per cent., but this is probably low, for the last traces of water appear to be very tenaciously held, and by the ignition method it is only after very prolonged heating that a constant weight is attained. After complete dehydration in this way, the substance does not re-absorb water when exposed to a moist atmosphere.

The mineral is essentially a hydrous silicate of magnesium, containing also aluminium, and although the analysis shows rather less of the latter constituent than is usual in the recorded analyses of saponite, the mineral is best referred to this species, which it further closely resembles in its general physical and blowpipe characters.

The recorded analyses of saponite vary between very wide limits for all the principal constituents, and this is no doubt to be explained, in part at least, on the assumption that the material analysed has in most cases been impure, or has consisted of a mixture of two or more substances. However, the analyses without exception show alumina to be present, and in most cases ferric oxide also, these two sesquioxides averaging more than 10 per cent., and even amounting to as much as 20 per cent. on occasion. Generally speaking, the sesquioxide and magnesia contents vary more or less inversely. The mineral appears, in every case, to lose about two-thirds of its water content at 100°C.

It may be doubted whether saponite, considered as a hydrous silicate of magnesium and aluminium, should be regarded as a definite species. Many analyses would approximate very closely to mixtures in varying proportions of, say, deweylite and kaolin. Clarke¹ suggests that "saponite is perhaps normally $H_4(MgOH)_2Si_2O_7$, although the analyses all show admixtures of some aluminous compound." The percentage composition calculated for Clarke's formula is given in the first column of the table above. It is perhaps a curious chance that the Montreal material gives almost exactly the ratios required by this

¹ The constitution of the Natural Silicates, U. S. Geological Survey, Bulletin 588, 1914, p. 109.