ART. XL.—*On the Formation of Silver Silicate*; by
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BUT very little seems to have been done with regard to the formation of silicate of silver in the wet way. In Gmelin-Kraut's *Inorganic Chemistry*, vol. iii, p. 970, the following statement is made:—"A solution of Ag_2O in $2(\text{HF})\text{SiF}_4$, evaporated to the consistency of a syrup, deposits hygroscopic crystals of $2\text{AgF} \cdot \text{SiF}_4 + 4\text{H}_2\text{O}$. Out of a solution of this compound, ammonia precipitates a yellow basic salt, if added in small quantities. An excess of ammonia precipitates silicate of silver." A like statement is made by Berzelius—*Lehrb. d. Chemie*; Dresden, 1836, vol. iv, p. 629. With the exception of a paper by Dr. M. W. Iles,* nothing seems to have been done in this direction since then. With regard to the production of silver silicate in the wet way, Dr. Iles merely repeated the above experiment, without making any analysis of the precipitate.

The method I have used is so simple that it seems strange that it has not been used before. The reaction made use of was:

The solution of Na_2SiO_3 was made by fusing together Na_2CO_3 and SiO_2 , and dissolving the mass in water. The amount of SiO_2

* *Engineering and Mining Journal*, April 19, 1884.

used was slightly in excess of the molecular proportion, and the silicate formed was therefore slightly acid. This solution was added to a neutral solution of AgNO_3 , and a lemon-yellow precipitate was thrown down. This was washed carefully with hot water, and dried. Dried between filter paper, the salt retains its original yellow color, but when completely dried in a bath, the color becomes darker. Two analyses gave the following results:

Ag_2O	77.42	77.41
SiO_2	22.66	22.52
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	100.08	99.93

Ag_2SiO_3 requires Ag_2O 79.45, SiO_2 20.55. This salt is, then, slightly acid, which agrees with the conditions of the precipitation, as the meta-silicate of sodium was slightly acid. From this it appears that all that is necessary to prepare a silicate of silver of a certain composition, is the pure corresponding sodium salt, and a neutral silver solution.

The silicate of silver is readily decomposed by all acids, and is perfectly soluble in ammonia. It bears a considerable degree of heat without decomposition, first changing its color to brown red, then back to the original yellow, a red heat, however, resolves it into Ag , O , and SiO_2 .

The above is intended merely as a preliminary notice, as I am still engaged in a further study of the salt and will publish my results when they are complete.

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