XXV.—*The Acid Sulphate of Hydroxylamine.*

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IT is somewhat remarkable that although several hydrochlorides of hydroxylamine have been described by Lossen, the acid sulphate seems never to have been prepared.

It is well known that if more sulphuric acid is present in an aqueous solution of hydroxylamine than is sufficient to form the normal salt, the addition of alcohol will cause this, and not the acid salt to crystallise out, just as when added to acid ammonium sulphate it precipitates the normal sulphate. Unless alcohol is added, a very acid solution of hydroxylamine sulphate often refuses to deposit anything; by attention, however, to a few details it can be made to yield crystals of the acid sulphate.

Solid hydroxylamine hydrochloride is treated with, as near as may be, the quantity of sulphuric acid calculated to form the acid salt, $(NH_3O)H_2SO_4$; the mixing is effected in a dish sufficiently large to avoid loss by frothing, and the mixture is heated for some hours on the water bath until all hydrochloric acid has been expelled. The resulting clear solution becomes viscid when cold, and refuses to yield the normal sulphate, and when a particle of this salt is dropt on to its surface it is slowly dissolved. If, however, it is left to stand uncovered in a dry, cold atmosphere,* and the vessel occasionally moved about, crystallisation suddenly sets in, and the solution becomes traversed by long prisms which almost fill it. Left in a desiccator for a couple of days more, it becomes a translucent cake of damp crystals. The crystals are very deliquescent, and, after crushing and pressure between porous tiles, yield results on analysis which prove them to be the acid sulphate of hydroxylamine.

The analysis of the salt was effected by titrating it with sodium hydroxide, using methyl-orange as indicator, since the normal

* Such as that of many winter days in Tokyo, Japan, when calcium chloride in an open vessel hardly deliquesces in a week, and caustic potash can be weighed in an uncovered scale-pan. In England, the atmosphere will be too damp, and a desiccated atmosphere will be necessary.

sulphate is neutral to it. The sulphuric acid was weighed as barium sulphate.

	Calculated.	Found.
Hydroxylamine	25·19	24·02
Sulphuric acid.....	74·81	72·68
	100·00	96·70