

Another sample of about 1 gram was selected with a view to trying some of the separation methods used in other instances. The specific gravity of the sample before grinding was 4.300 at 15.5° C. This sample on analysis gave the following results:

	Fe	Co	Cu	As	S	Sb	Ni	Total
Per cent.	23.60	5.94	.38	69.68	.96	trace	absent	99.96
Mol. Ratio	.4227	.1007	.0059	.9212	.0299	....	....	....
Arsenopyrite (Fe As S)	.0299	....	....	.0299	.0299	....	....	....
Safflorite (Co As ₂)	....	.1007	....	.2014	....	....	....	....
Löllingite (Fe As ₂)	.3449	....	....	.6899	....	....	....	....
Excess	.0179	....	....	....	....	....	....	....

$$\text{Fe : Co} = 1 : 0.251$$

Compared with the first analysis, this one shows that the mass varies somewhat in composition from place to place, thus confirming the conclusions arrived at by microscopic examination, that the material is an intergrowth of distinct minerals.

As only a small amount of material was available the separation experiments were carried out on about 5 or 6 grams. Only iron and cobalt were determined.

Exp. 1. Concentrated hydrochloric acid with a little potassium chlorate on 250 mesh powder. The filtrate contained relatively much copper.

$$.0226 \text{ g Fe and } .0054 \text{ g Co, or Fe : Co} = 1 : 0.237.$$

Exp. 2. Silver nitrate solution on 250 mesh powder, filtrate contained .0307 g Fe and .0055 g Co or Fe : Co = 1 : 0.244.

Exp. 3. Nitric acid (1 : 1) on 250 mesh powder, filtrate contained .0852 g Fe and .0163 g Co or Fe : Co = 1 : 0.191. This treatment was continued and the final residue yielded .1363 g Fe and .0635 g Co or Fe : Co = 1 : 0.267.

These experiments for lack of sufficient material could not be carried far enough to obtain definite separations and their value is also lessened because sulphur was not determined, as at that time the arsenopyrite had not been recognized, and it was thought that löllingite and safflorite were the only important variables, whereas, there are certainly three, and possibly five, minerals present. There seems to be, however, no great difference in the solubility of the minerals when in the form of a fine powder, except that the copper mineral, whatever it may be, seems to be more readily attacked than the others. This probably is because the minerals, being closely related chemically and crystallographically, have only small differences in solubility and potential. Furthermore, when finely powdered, the electrical contact between the mineral protected and the protecting mineral is