Ferric Sulphate. — Formula, $Fe_2(SO_4)_3$. Molecular weight, 399.26.

Synonyms.—Persulphate of iron. Tersulphate of iron.

This salt is formed when ferrous sulphate is dissolved in water, with excess of sulphuric acid, nitric acid being then added to the heated mixture as long as red fumes escape. The reaction is expressed as follows:—

$$6FeSO_4 + 3H_2SO_4 + 2HNO_3 = 3Fe_2(SO_4)_3 + 4H_2O + 2NO.$$

Ferrous sulphate. Sulphuric acid. Nitric acid. Ferric sulphate. Water. Nitric oxide.

Persulphate of iron is the form of ferric salt directed by the U. S. P. as the basis for ferric hydroxide and the scaled salts of iron. It is known in solution as—

Liquor Ferri Tersulphatis, or *solution of tersulphate of iron,* and as such is recognized by our Pharmacopœia. The mode of preparing the solution is essentially as follows:—

Mix one troy ounce and three hundred and sixty grains of nitric acid with two troy ounces and sixty grains of sulphuric acid, and half a pint of water, in a capacious porcelain capsule, and heat the mixture to the boiling point. Add gradually twelve troy ounces of ferrous sulphate, heat until excess of nitric acid is expelled, cool and then add water until the contents of the dish will measure twenty-four fluid ounces. Solution of *tersulphate* of iron, U. S. P., is identical in chemical composition with solution of *persulphate* of iron, B. P. The strength of the British solution (specific gravity 1.441) is a little greater than that of our own (specific gravity 1.320). The color of this preparation is brown. It has no odor and is very acid and astringent to the taste. If it be diluted with water, it changes to a reddish color. The foregoing preparation must not be confused with the well known styptic,

Monsel's Solution (Liquor Ferri Sub-sulphatis, U. S. P. often called solution of persulphate of iron.)

This preparation is made in the same manner as solution of tersulphate of iron, but the sulphuric acid is not in sufficient amount for the production of a true ferric

sulphate, therefore, an oxy-sulphate results. Monsel's solution, or solution of sub-sulphate of iron† should always be designated by one of the terms just named, and *not* as persulphate of iron. It is of a dark brown-red color, and of specific gravity 1.552. It is very astringent, and is not acid to the taste like tersulphate of iron. The use is as a styptic, and as such it is among the most valuable. There are many basic ferric sulphates known, but the above only is of use in medicine. If Monsel's solution be placed in an open dish, and exposed to the atmosphere, especially near escaping steam, a light-yellow mass will result, which when powdered is known as *Monsel's salt.* It is employed as a styptic, and is a basic ferric oxy-sulphate.

Ferric Sulphate and Ammonium—Formula $(NH_4)_2$-$Fe_2(SO_4)_4.24H_2O$. Molecular weight, 962.14.

Synonyms. — Ferri et ammonii sulphas. Sulphate of iron and ammonium. Ammonio-ferric alum.

Dissolve four and one-half ($4\frac{1}{2}$) troy ounces of sulphate of ammonium in two pints of solution of persulphate of iron (tersulphate U. S. P.) by the aid of heat. Place the solution in a cool place to crystallize. This is a double salt of ammonium and ferric sulphates, and as such may be represented by $(NH_4)_2SO_4.Fe_2(SO_4)_3.24H_2O$. It crystallizes in regular octohedrons, is astringent, and from analogy is called *alum.* According to the writer's experience it is unnecessary to heat the solution of the two sulphates above 150° F. A temperature of 212° F., decomposes the salt into the two sulphates, but they reunite as the solution cools. Sulphate of iron and ammonium is of a pink color when warm, of a beautiful bluish purple when cold and first crystallized. It will keep if closely corked, or if preserved in an atmosphere which is saturated with moisture. If a large crystal be suspended in

† The meaning of the prefix *sub* (under) here is only with reference to the highest sulphate, the ferric sulphate. Sub-sulphate of iron is intermediate between ferrous sulphate, $FeSO_4$, and ferric sulphate $Fe_2(SO_4)_3$.