

UNITED STATES PATENT OFFICE.

CHARLES A. DOREMUS, OF NEW YORK, N. Y.

PROCESS OF MANUFACTURING HYDROFLUORIC ACID.

SPECIFICATION forming part of Letters Patent No. 754,978, dated March 22, 1904.

Application filed July 31, 1902. Serial No. 117,808. (No specimens.)

To all whom it may concern:

Be it known that I, CHARLES A. DOREMUS, a citizen of the United States, residing in the borough of Manhattan, in the city and State of New York, have invented a new and useful Process of Manufacturing Hydrofluoric Acid, of which the following is a specification.

The object of my invention is to produce hydrofluoric acid which shall be free from the hydrofluorsilicic acid with which owing to the presence of silica in either fluor-spar or kryptolith the commercial hydrofluoric acid obtained from these natural ores is usually contaminated. Silicon fluorid can be obtained either from these natural ores or from artificial products and easily be made to yield hydrofluorsilicic acid. Such hydrofluorsilicic acid may be used for my process.

My improved process consists in treating with an excess of finely-ground bauxite or kaolin either hydrofluorsilicic acid or a mixture of hydrofluorsilicic acid and hydrofluoric acid until a perfectly neutral solution of aluminium fluorid is thereby obtained, the fluor-silicate which is first formed being decomposed by the excess of aluminous material to yield the fluorid and a precipitate of silicic acid, which, together with insoluble substances, is separated by filtration. The aluminium fluorid may be obtained in crystalline form, either by cooling or by evaporation. When dry, the fluorid is placed in an iron retort and there heated to redness. This retort has an outlet which connects with a leaden condenser. When the fluorid is red-hot, it is subjected to the action of superheated steam, which is introduced into the retort. Hydrofluoric acid

of great purity is rapidly evolved and condensed. Aluminium oxid remains in the retort. The yield of acid from the fluorid is practically theoretical. I have similarly obtained and treated other metallic fluorids.

Other apparatus than a retort has been successively employed by me, with the results above mentioned, and therefore I do not restrict my process to the use of a retort in which to subject the fluorid to the action of superheated steam.

In treating the hydrofluorsilicic acid or the mixture thereof and hydrofluoric acid heat facilitates the action.

Calcined aluminous materials may be used.

What I claim as new, and desire to secure by Letters Patent, is—

1. The process of making hydrofluoric acid from hydrofluorsilicic acid, which consists in treating the hydrofluorsilicic acid with an excess of a metallic compound, thereby producing a fluorid, and then subjecting such fluorid to the action of superheated steam, thereby liberating hydrofluoric acid, substantially as described.

2. The process of making hydrofluoric acid from a mixture of hydrofluorsilicic acid and hydrofluoric acid, which consists in treating said mixture with an excess of a metallic compound, thereby producing a fluorid, and then subjecting such fluorid to the action of superheated steam, thereby liberating hydrofluoric acid, substantially as described.

CHARLES A. DOREMUS.

Witnesses:

GEORGE J. GROTE,

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