UNITED STATES PATENT OFFICE.

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PROCESS FOR PREPARING OXIDS OF URANIUM.

1,224,013. Specification of Letters Patent. Patented Apr. 24, 1917.

No Drawing. Application filed May 19, 1915. Serial No. 29,210.

(DEDICATED TO THE PUBLIC.)

To all whom it may concern:

Be it known that I, CHARLES L. PARSONS, a resident of Durham, in the county of Strafford and the State of New Hampshire, have invented a new and useful Process for Preparing Oxids of Uranium, of which the following is the specification.

This application is made under the act of March 3, 1883, chapter 143 (22 Stat. L., 625), and the invention herein described and claimed may be used by the Government of the United States, or by any of its officers or employees in the prosecution of work for the Government, or by any person in the United States, without payment of any royalty thereon.

The object of my invention is to prepare oxids of uranium from uranium compounds, such as the uranates.

With the foregoing object in view, the invention resides in the combination and details of treatment hereinafter described and claimed, it being understood that changes in the fluxes and solvents, and the proportions thereof, and in minor details, may be made within the scope of the claims without departing from the spirit or sacrificing any of the advantages of the invention.

In carrying out my invention in its preferably form, I proceed substantially as follows:

An alkali metal uranate, such, for example, as sodium uranate, and charcoal, both previously thoroughly pulverized, are mixed with fine grained salt (NaCl), in about the following proportions: sodium uranate, 20 parts; charcoal, 1 part; and salt, 35 parts. This mixture is fused in a receptacle of any suitable character, when the uranate will be converted into oxid of uranium. The mass is allowed to cool and is then treated with water which dissolves out the soluble matter, leaving a residue consisting substantially of uranium oxid. This is washed with an alkaline solution, as for example, a 2 or 3 per cent. solution of sodium hydroxid. The mass is then washed with water followed by digestion and washing with an acid solution, preferably a 3 to 5 per cent. hydrochloric acid solution, to remove certain impurities which may be present. The mass is then dried.

Instead of charcoal any other suitable reducing agent may be employed, and instead of sodium chlorid any other suitable flux.

Any suitable receptacle for the fusing may be used, such as a nickel, wrought iron or cast steel crucible, or the operation may take place in a reverberatory or muffle furnace lined with any suitable resistant material, such for example, as magnesia or carborundum brick.

This invention is not limited to the treatment of any particular uranate and, moreover, the process is not only capable of being used with uranates and diuranates but with other compounds of uranium, susceptible of reduction to oxid of uranium, such as uranyl chlorid, uranyl sulfate, etc.

I claim:

1. The process of preparing uranium dioxid, consisting in reducing a uranium compound in a fused bath with carbonaceous matter.

2. The process of preparing uranium dioxid, consisting in fusing a mixture of a uranium compound and a flux in the presence of carbonaceous material.

3. The process of preparing oxid of uranium, consisting in reducing a uranate in a fused bath with carbonaceous matter.

4. The process of preparing uranium dioxid, consisting in fusing a mixture of a uranate and a flux in the presence of a carbonaceous material.

5. The process of preparing uranium dioxid consisting in finely dividing a uranate, a flux and carbonaceous matter, mixing and subjecting the mixture to fusion.

6. The process of preparing uranium dioxid, consisting in fusing a mixture of finely divided alkali metal uranate, flux and carbonaceous matter, cooling, dissolving out soluble matter and washing the residue.

7. The process of preparing uranium dioxid consisting in fusing a mixture of a uranate and a flux in the presence of a reducing agent, dissolving out soluble matter, washing successively with an alkali solution, water and an acid.

8. The process of preparing uranium dioxid, consisting in fusing a mixture of a uranate and a flux, in the presence of a reducing agent, dissolving out soluble matter with water and washing the residue.

CHARLES L. PARSONS.