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UNITED STATES PATENT OFFICE.

ABRAHAM VAN WINKLE, OF NEWARK, NEW JERSEY, ASSIGNOR TO THE HANSON & VAN WINKLE COMPANY, OF NEWARK, NEW JERSEY, A CORPORATION OF NEW JERSEY.

ELECTROLYTE.

No. 901,758. Specification of Letters Patent. Patented Oct. 20, 1908.

Application filed October 24, 1907. Serial No. 398,871.

To all whom it may concern:

Be it known that I, ABRAHAM VAN WINKLE, a citizen of the United States, and a resident of Newark, in the county of Essex and State of New Jersey, have invented a new and Improved Electrolyte, of which the following is a full, clear, and exact description.

The invention relates to electro-chemistry, and its object is to provide a new and improved electrolyte for use in the electro deposition of zinc on iron and steel, and with a view to increase the conductivity of the solution, to improve the color of the deposit and to insure a perfect plating, especially of concave surfaces.

In the present processes for electroplating with zinc, called cold galvanizing, as distinguished from the hot process of galvanizing, the following salts are used with varying success, namely: sulfate and chlorid of zinc combined with sulfate of aluminum, sulfate of magnesia and similar combinations.

In order to increase the conductivity of the solution, to improve the color of the deposition and to insure a perfect plating, especially of curved surfaces or recesses, I use an electrolyte formed of a fluorid of zinc solution.

In practice, I prefer to saturate thirty per cent. hydro-fluoric acid with silica, and then saturate this solution with zinc. The resultant liquid is then diluted with water to about ten per cent. Baumé, and the zinc is slightly neutralized by the addition of a small quantity of an alkali, such as carbonate of ammonia.

A good result is also obtained by adding slowly to a sulfate of zinc solution, a small quantity of thirty per cent. hydrofluoric acid.

The electrolyte may also be formed by saturating diluted hydrofluoric acid with zinc and adding a small quantity of carbonate of ammonia. In this instance the conductivity of the solution is increased but there is a tendency to form a sub-salt on the anodes. In order to prevent this sub-salt formation and to present a clean metallic surface to the solution, it is desirable to use an anode made of zinc, containing a small quantity of mercury.

If desired the spent acid, consisting of hydrofluoric acid partly saturated with silica, and resulting from cleaning the iron and steel castings of the sand by the use of ordinary hydrofluoric acid, may be used in forming the solution.

In either of the cases mentioned the conductivity of the electrolyte is increased and the color of the deposit is improved.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. An electrolyte comprising fluorid of zinc in solution.

2. An electrolyte comprising slightly neutralized fluorid of zinc in solution.

3. An electrolyte comprising a fluorid of zinc solution, and an alkali for slightly neutralizing the fluorid of zinc.

4. An electrolyte comprising a fluorid of zinc solution, and carbonate of ammonia.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ABRAHAM VAN WINKLE.

Witnesses:
WILSON C. STEWART,
J. J. MOORE, JR.