This invention has for its object the electrolysis of ferrous chloride in aqueous solution, in order to recover therefrom pure electrolytic iron and pure chlorine in one operation, without excessive consumption of power.

In accordance with the present invention I employ a concentrated solution of ferrous chloride, which I maintain at a temperature of 90-100° C. and I allow this solution to flow through the electrolytic cell at such a rate that the issuing spent liquor contains about 20 parts of ferrous chloride as FeCl₂ per 100 parts by weight of liquor.

I use as the cathode a thin plate, mandrel or other suitable object, which may be stationary or may be rotated. As the anode I use a rod, plate or cylinder of carbon or other inert material, which I support in a concentrated solution of a suitable chloride, such as sodium, calcium, magnesium or other similar chloride, contained in an anode compartment or chamber.

The partition between the anode and cathode solutions may be a cylinder or wall across the cell, and may be formed from porous clay, preferably unglazed, or other suitable porous material, which whilst opposing only a low resistance to the electric current, serves to prevent diffusion between the two solutions. Such partitions may be formed by moulding from a good china clay paste, without addition of any soluble, fluxing or glazing material, drying slowly in known manner, and firing at a temperature of 600-900° C.

For the electrolysis I employ a current of 10-25 amperes per square foot, at a pressure of 2.3-3.0 volts. Under these conditions a uniform coherent deposit of iron is obtained on the cathode whilst pure chlorine is evolved at the anode. The anode compartment is enclosed in known manner, and provided with an exit pipe for chlorine at the top; the chlorine gas is passed through a condenser, so that water vapour carried off with the chlorine is deposited. The water so condensed may be returned to the anode compartment or chamber. The current efficiency is 90-100% estimated on both the chlorine and the iron deposited.

The spent liquor is used to dissolve further quantities of ferrous chloride to form a concentrated solution, so that a continuous circulation is maintained. The cell and circulating pipes are preferably enclosed to prevent atmospheric oxidation.

I claim:—

1. A process for the recovery of electrolytic iron and chlorine from ferrous chloride, consisting in electrolyzing a concentrated solution of the ferrous chloride in an electrolytic cell having a cathode, on which the iron is deposited, and an anode of inert material, said anode surrounded by a concentrated solution of a chloride of a metal more electropositive than iron and collecting the chlorine evolved at the anode.

2. A process for the recovery of electrolytic iron and chlorine from ferrous chloride, consisting in electrolyzing a concentrated solution of the ferrous chloride in an electrolytic cell using a current of 10 to 25 amperes per square foot and a pressure of 2.3 to 3.0 volts, a cathode adapted to receive a deposit of the iron, and an anode of inert material, said anode surrounded by a concentrated solution of a chloride of a metal more electropositive than iron and collecting the chlorine evolved at the anode.

In testimony whereof I have signed my name to this specification.

STANLEY ISAAC LEVY.