129,152

PATENT SPECIFICATION

Application Date, Aug. 8, 1918. No. 12,881/18.
Complete Left, Jan. 23, 1919.
Complete Accepted, July 10, 1919.

PROVISIONAL SPECIFICATION.

Improvements in and relating to the Production of Azides.

I, WILLIAM RICHARD HODGKINSON, C.B.E., F.R.S.Ed., of Ordnance College, Woolwich, London, S.E. 18, Professor of Chemistry and Metallurgy, do hereby declare the nature of this invention to be as follows:—

This invention relates to the production of azides and has for object to provide improvements in the production of these compounds.

The invention consists broadly in treating an azide of a metal with a salt whose acidic or negative constituent will form with the basic or positive constituent of the azide treated, an insoluble salt.

More particularly the invention consists in treating silver azide in this manner to produce other azides and insoluble compounds of silver; thus for instance, silver azide may be treated with sodium chloride to produce sodium azide, silver chloride being produced as a bye-product.

A further feature of the invention is the treatment of the azide produced in the manner specified with salts of metals yielding insoluble or soluble other azides by double decomposition.

Preferably the azides are formed by diazotising salts of hydrazine by means of nitrous acid or a suitable nitrite under such conditions that the reaction mass is on the border line of acidity and alkalinity, in the presence of a salt adapted to yield an insoluble azide, separating off the insoluble azide and then treating the insoluble azide with a salt of an acid which will form with the base of the azide, an insoluble salt.

According to the preferred manner of carrying the invention into effect, a solution containing a salt of hydrazine as, for instance, hydrazine sulphate, neutralised and rendered faintly alkaline with ammonia or soda, and an equivalent proportion of sodium nitrite, is prepared and this mixed solution is then added to a solution of silver nitrate rendered slightly acid with nitric acid, under conditions of violent agitation, the temperature being regulated so as not to exceed 30° C.

Silver azide will thus be formed and will separate out under favourable conditions in quantity equivalent to 85% of the theoretical.

The silver azide is washed with cold water and suspended or agitated with a proportion of a solution of common salt slightly less than is required according to the equation:—

$$AgN_3 + NaCl = AgCl + NaN_3.$$

The reaction in these conditions is completed in a few minutes, and the silver chloride may then be filtered off and the solution of sodium azide concentrated

on a steam bath. In this way sodium azide in an approximately pure state will be obtained and this sodium azide may be employed for the formation of lead azide or other salt in the usual way.

Dated this 8th day of August, 1918.

MARKS & CLERK.

COMPLETE SPECIFICATION.

Improvements in and relating to the Production of Azides.

I, WILLIAM RICHARD HODGKINSON, C.B.E., F.R.S.Ed., of Ordnance College, Woolwich, London, S.E. 18, Professor of Chemistry and Metallurgy, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to the production of azides and has for object to provide improvements in the production of these compounds.

The invention consists broadly in treating an azide of a metal with a salt whose acidic or negative constituent will form with the basic or positive constituent of the azide treated, an insoluble salt.

More particularly the invention consists in treating silver azide in this manner to produce other azides and insoluble compounds of silver; thus for instance, silver azide may be treated with sodium chloride to produce sodium azide, silver chloride being produced as a bye-product.

A further feature of the invention is the treatment of the azide produced in the manner specified with salts of metals yielding insoluble or soluble other azides by double decomposition.

Preferably the azides are formed by diazotising salts of hydrazine by means of a suitable nitrite under such conditions that the reaction mass is on the border line of acidity and alkalinity, that is to say, is at no time so distinctly acid as to redden litmus paper and is for instance comparable with the conditions of acidity as indicated by litmus paper of a solution of boric acid and bringing this solution together with a salt adapted to yield on insoluble azide, separating off the insoluble azide and then treating the insoluble azide with a salt of an acid which will form with the base of the azide, an insoluble salt.

According to the preferred manner of carrying the invention into effect, a solution containing a salt of hydrazine as, for instance, hydrazine sulphate, neutralised and rendered faintly alkaline with ammonia or soda, and an equivalent proportion of sodium nitrite, is prepared and this mixed solution is then added to a solution of silver nitrate rendered slightly acid with nitric acid, under conditions of violent agitation, the temperature being regulated so as not to exceed 30° C.

Silver azide will thus be formed and will separate out under favourable conditions in quantity equivalent to 85% of the theoretical.

The silver azide is washed with cold water and suspended or agitated with a proportion of a solution of common salt slightly less than is required according to the equation:—

$$AgN_3 + NaCl = AgCl + NaN_3.$$

The reaction in these conditions is completed in a few minutes, and the silver chloride may then be filtered off and the solution of sodium azide concentrated on a steam bath. In this way sodium azide in an approximately pure state

will be obtained and this sodium azide may in accordance with the invention be employed for the formation of lead azide or other azides by double decomposition with lead or other salts.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. The process of producing azides which comprises treating an azide of a metal with a salt whose acidic or negative constituent will form with the basic or positive constituent of the azide treated, an insoluble salt.

2. The process of producing azides which comprises treating silver azide in the manner claimed in Claim 1 to produce other azides and insoluble compounds of silver.

3. The process of producing azides as claimed in Claim 1 or 2, in which the azide employed initially, is formed by diazotising salts of hydrazine by means of a suitable nitrite under such conditions that the reaction mass is on the border line of acidity and alkalinity, in the presence of a salt adapted to yield an insoluble azide.

4. The improved process of producing azides substantially as hereinbefore described.

Dated this 23rd day of January, 1919.

MARKS & CLERK.

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