

UNITED STATES PATENT OFFICE.

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REDUCTION OF INDIGO COLORING-MATTERS.

No. 820,900.

Specification of Letters Patent.

Patented May 15, 1906.

Application filed April 22, 1905. Serial No. 256,986.

To all whom it may concern:

Be it known that I, ROBERT WIMMER, a subject of the King of Bavaria, residing at Ludwigshafen-on-the-Rhine, in the Kingdom of Bavaria, German Empire, have invented new and useful Improvements in the Reduction of Indigo Coloring-Matters, of which the following is a specification.

My invention relates to the reduction of indigo coloring-matters.

For the reduction of indigo coloring-matters to produce the soluble leuco compounds the only metal which has hitherto been used on a commercial scale is zinc-dust in the presence of alkali. I have discovered that although under the ordinary conditions of preparing an indigo-vat indigo is not satisfactorily reduced by iron, yet that iron can be advantageously used for the reduction of indigo coloring-matters and favorable results be obtained if the reduction be effected in the presence of caustic-alkali solutions much stronger than have hitherto been employed or proposed. I have found, for instance, that the reduction proceeds in a caustic-alkali solution of ten degrees Baumé, (10° B.,) although more strongly concentrated solutions may be employed. Of course the iron used must be in a finely-divided condition. The reaction commences at a temperature of about fifty degrees centigrade, (50° C.)

An advantage of my invention is that after the reduction in accordance therewith the solution can be filtered and the filtrate (which contains a high percentage of indigo white) can be placed on the market without any further treatment, since it contains no metal, whereas zinc when used as the reducing agent

goes into solution and has to be separated before the solution can be used for dyeing.

The following examples will serve to further illustrate the nature of my invention, which, however, is not confined to these examples. The parts are by weight.

Example 1: Dissolve one hundred and ten (110) parts of caustic soda in six hundred and forty (640) parts of water and add sixty (60) parts of iron in a finely-divided state. Heat this to a temperature of seventy-five degrees centigrade (75° C.) and while stirring add gradually two hundred and fifty (250) parts of indigo pure B. A. S. F., which after a short time goes into solution. Filter by the aid of the pump and wash the residue. In this way a thirty (30) per cent. solution of indigo white is obtained.

Example 2: Add while stirring sixty (60) parts of iron-powder to two hundred and fifty (250) parts of caustic-soda solution containing about thirty-five (35) per cent. of NaOH, heat to a temperature of about eighty degrees centigrade, (80° C.,) and then add three hundred (300) parts of bromindigo, which becomes reduced after a short time.

Now what I claim is—

The reduction of indigo coloring-matters by heating the same with iron-powder in caustic-alkali solution which contains at least six and a half per cent. of solid caustic alkali.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

ROBERT WIMMER.

Witnesses:

ERNEST F. EHRHARDT,
J. ALEC. LLOYD.