

GOVERNMENT OF INDIA, THE PATENT OFFICE, 214, LOWER CIRCULAR ROAD, CALCUTTA-17.

Specification No. 101925. Application No. 101925, dated 8th October 1965. Complete Specification left on 5th August 1966. (Application accepted 6th April 1967.)

Index at acceptance—40F [IV(1)].

IMPROVEMENTS IN OR RELATING TO THE CHEMICAL POLISHING OF COPPER AND ITS ALLOYS.

PROVISIONAL SPECIFICATION

COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH, RAFI MARG, NEW DELHI-1, INDIA, AN INDIAN REGISTERED BODY INCORPORATED UNDER THE REGISTRATION OF SOCIETIES ACT (ACT XXI OF 1860).

The following specification describes the nature of this invention.

This is an invention by Mr. Balkunje Ananda Shenoi (Scientist), Miss Sethuraman Gowri (Senior Laboratory Assistant) and Miss Karaikudi Sankaranarayana Sastri Indira (Senior Scientific Assistant), Citizens of India and employed in the Central Electrochemical Research Institute, Karaikudi-3, Madras State, India.

This invention relates to improvements in or relating to chemical polishing of copper and its alloys.

Hitherto it has been proposed to resort to acid baths containing nitric acid, phosphoric acid and/or acetic acid with or without arsenic oxide for polishing of copper or its alloys.

This is open to the objection that the above process gives rise to fumes, costly sensitive to moisture, and of short life and loss of metal during polishing is very high and requires post-treatment to prevent tarnishing.

The object of this invention is to obviate these disadvantages by using an aqueous solution containing alkali metal dichromate, sulphuric acid and an organic inhibitor from aromatic family containing an imido group.

To these ends, the invention broadly consists in treating copper or its alloys chemically in a solution containing alkali metal dichromate mineral acid e.g., sulphuric acid in suitable concentration and the said inhibitor for 5-60 sec. at temperatures ranging from 30-80°C.

The following typical examples are given to illustrate the invention :

EXAMPLE 1

Potassium dichromate	20 gms/l
Sulphuric acid	100 cc/l
Inhibitor	4 gms/l
Temperature	30-50°C
Time	10-50 sec.

EXAMPLE 2

Sodium dichromate	65 gpl
Sulphuric acid	150 cc/l
Inhibitor	6.5 gpl
Temperature	40-60°C
Time	5-60 sec.

The following are among the main advantages of the invention :

1. Not sensitive to water ;
2. No drying is necessary before polishing and hence useful for continuous operation ;
3. Does not require any post-treatment to retain the lusture before lacquering ;
4. No abnoxious fume is evolved during the treatment ;
5. Wide range of operating condition such as temperature concentration, time of treatment etc ;
6. Easily regenerable ;
7. Minimum metal loss and hence longer life ;
8. This is the first formulation containing the 'in building' of the inhibitor in the chemical polishing bath.

R. BHASKAR PAI,

PATENTS OFFICER,

COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH.

Dated this 23rd day of September 1965.

COMPLETE SPECIFICATION

COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH, RAFI MARG, NEW DELHI-1, INDIA, AN INDIAN REGISTERED BODY INCORPORATED UNDER THE REGISTRATION OF SOCIETIES ACT (ACT XXI OF 1860).

The following specification particularly describes and ascertains the nature of this invention and the manner in which it is to be performed.

This is an invention by Mr. Balkunje Ananda Shenoi, Scientist, Miss Sethuraman Gowri, Senior Laboratory Assistant and Miss Karaikudi Sankaranarayana Sastri Indira, Senior Scientific Assistant, Citizens of India and employed in the Central Electrochemical Research Institute, Karaikudi-3, Madras State, India.

This invention relates to improvements in or relating to chemical polishing of copper and its alloys.

Hitherto it has been proposed to resort to acid baths containing nitric acid, phosphoric acid and/or acetic acid with or without arsenic oxide for polishing of copper or its alloys.

This is open to the objection that the above process gives rise to fumes, is costly, sensitive to moisture and is of short life and the loss of metal during polishing is very high and requires post-treatment to prevent tarnishing.

The object of this invention is to obviate these disadvantages by using an aqueous solution containing alkali metal dichromate, sulphuric acid and an organic inhibitor from aromatic family containing an imido group.

To these ends, the invention broadly consists in treating copper or its alloys chemically in an aqueous solution containing alkali metal dichromate, mineral acid such as sulphuric

acid and an organic inhibitor from aromatic family containing an imido group such as benzotriazole.

Thus copper or its alloys are treated chemically in a solution containing alkali metal dichromate, mineral acid, e.g., sulphuric acid in suitable concentration and the said inhibitor for 5-60 sec. at temperature ranging from 30-80°C.

The following typical examples are given to illustrate the invention :

EXAMPLE 1

Potassium dichromate	20 gms/l
Sulphuric acid	100 cc/l
Inhibitor	4 gms/l
Temperature	30-50°C
Time	10-50 sec.

EXAMPLE 2

Sodium dichromate	65 gpl
Sulphuric acid	150 cc/l
Inhibitor	6.5 gpl
Temperature	40-60°C
Time	5-60 sec.

Price: TWO RUPEES.

The following are among the main advantages of the invention :

1. Not sensitive to water ;
2. No drying is necessary before polishing and hence useful for continuous operation ;
3. Does not require any post-treatment to retain the lusture before lacquering ;
4. No abnoxious fume is evolved during the treatment ;
5. Wide range of operating condition such as temperature concentration, time of treatment etc. ;
6. Easily regenerable ;
7. Minimum metal loss and hence longer life ;
8. This is the first formulation containing the 'in building' of the inhibitor in the chemical polishing bath.

We claim :

1. A process for the chemical polishing of copper or its alloys which consists in chemically treating copper or its alloys in an aqueous solution containing alkali metal dichro-

mate, mineral acid such as sulphuric acid and an organic inhibitor from aromatic family containing an imido group such as benzotriazole.

2. A process as claimed in Claim 1 wherein copper or its alloys are treated chemically in a solution containing alkali metal dichromate, mineral acid *e.g.*, sulphuric acid in suitable concentration and the said inhibitor for 5-60 sec. at temperatures ranging from 30-80°C.

3. A process for the chemically polishing of copper substantially as described in the examples.

4. Copper or its alloys whenever subjected to chemical polishing according to a process substantially as hereinbefore described.

R. BHASKAR PAI,

PATENTS OFFICER,

COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH.

Dated this 2nd day of August 1966.