YHX

Product Inspection Procedures
Shaanxi Ehisen Technology Co., Ltd.

Q/YHX02-2019
Replace Q/YHX02-2018

Controlled

Titanium anode for electrolytic preparation of sodium hypochlorite

2019-04-28 Publish **2019-05-06 Implement**

Shaanxi Ehisen Technology Co., Ltd. Publish

Introduction

This standard is formulated for the third time.

This standard is drafted by the technical department of Shaanxi Ehisen Technology Co., Ltd.

This standard drafting department: R & D center, complete equipment and technology department.

Drafters of this standard: Miao Lei, Ren Chao.

Reviewer of this standard: Xue Liang.

This standard approved by: Xu Boshi.

1.Scope

This standard is applicable to metal anode coatings with seawater or dilute brine with NaCl content below 10% as electrolyte, Ir/Ru as coating body and titanium as substrate.

2.Normative reference standards

The terms in the following documents become terms of this Standard by reference to this Standard. For dated references, all subsequent revisions (excluding errors) or revisions shall not apply to this Standard. However, parties to an agreement under this standard are encouraged to study whether to use the most recent version of these documents. For undated references, the latest version of the document applies to this standard.

GB/T3620-2007 Titanium and titanium alloy grades and chemical composition

HMTS/ CH-3-06-1999 Product Standard for chloro-iridium acids, precious metal compounds

Q/XB1921-2006 Chloro-iridium acid

HG/T 3679-2000 Ruthenium trichloride

3.Terminology

3.1 Enhance life span

Anode coating in a specified sulfuric acid solution, under the specified current density of electrolytic reaction life.

4.Technical requirements

4.1 Product classification

Product classification conforms to the provisions of Table 1

Table 1 Product brand, type and material

Coating Grade	Type	Substrate Material
TJ-A	Tube, plate, net	TA1 or TA2

4.2 The substrate of the metal anode is made of industrial pure titanium, and its chemical composition shall comply with the provisions of GB/T3620-2007 Fine.

4.3 The content of chloro-iridium acid for coating preparation shall comply with the provisions of Table 2, and ruthenium trichloride shall comply with the provisions of Table 3.

4.4 The anode dimensions shall meet the requirements in the drawings provided by the user.

4.5 The technical requirements of the anode coating shall comply with the provisions of Table 3.

4.5 Appearance requirements for anode coatings

4.5.1 The anode surface should be pollution-free and free of impurities.

Table 2 chloroiridium acid content

Element	content
Ir (Iridium)	35±0.2 %
Ca (Calcium)	< 200 ppm
Fe (iron)	< 200 ppm
Na (Sodium)	< 200 ppm
Cu (Copper)	< 50 ppm
Mg (magnesium)	< 50 ppm
Cd (cadmium)	< 50 ppm
Mn (Manganese)	< 50 ppm
Al (Aluminum)	< 50 ppm

Table 3 Content of ruthenium trichloride

Element	content
Ru (Ru)	37 %
Ag (Silver)	< 150
Pd (Palladium)	< 150
Au (gold)	< 150
Fe (iron)	< 150
Al (Aluminum)	< 150
Pb (lead)	< 150

Au (copper)	< 150
Ni (nickel)	< 150
Na (sodium)	< 200

Table 4 Technical requirements for anode coatings

Project	Technical Index
Reinforcement life (h)	⩾60
Polarizability (mV)	40
Chlorine evolution potential (V)	1.13

4.5.2 For plate anodes, each anode shall not have more than two scratches, each scratch shall be less than 10mm in length and less than 2mm in width, and the depth shall not expose the substrate.

4.5.3 For plate anodes, the surface of each anode shall not be more than two scratches, and the area of each scratch shall be less than $5mm^2$.

4.5.4 For tubular and rod anodes, scratches or scrapes on the surface of each anode shall not exceed three, and the length of each scratch or scratch shall not exceed 20mm.

4.6 Requirements for anode coating bonding status

4.6.1 The bonding state of the coating surface layer shall be bonded with colorless transparent tape, and the tape shall be qualified without obvious black marks.

5.Test methods

5.1 Test piece requirements

5.1.1 The main test method used in this standard is sample detection.

5.1.2 The material and grade of the sample substrate should be consistent with the same batch of anode substrate. Hang one sample for each batch.

5.1.3 The sample shall be sheetlike and the size shall be 100×100~200×2~3mm

5.1.4 In the coating manufacturing process, the surface treatment process, coating liquid, brushing times, heat treatment process and the amount of coating liquid per unit area of the sample and the same batch of anodes shall be the same.

5.2 Anode dimensions are measured with standard measuring tools (tape measure, ruler, vernier caliper, etc.).

5.3 The precious metal content is controlled by the actual amount of ingredients.

5.4 The enhanced life test was carried out according to the conditions in Table 4.

Table 4 Conditions of enhanced life test

Dielectric	current density (A/m^2)	Temperature (℃)
1mol/L sulfuric acid	20000	40±5

Dc constant current power supply was used for electrolytic measurement. For enhanced life test, 2 or more samples (with an area of about $2cm^2$) must be randomly selected from the test pieces, and the sample with the shortest life is taken as the measurement value, and the end of life is judged by the increase of groove pressure by 10v.

5.5 The appearance of the anode coating shall be checked piece-by-piece with the naked eye.

5.6 The bonding state of the coating surface is checked in accordance with standard 4.6.1.

6.Check the rules

6.1 The anode shall be inspected by the quality department of the supplier or the department entrusted by the supplier to ensure that the product quality meets the provisions of this standard, and fill in the product quality certificate.

6.2 The Demander may inspect the received products according to the provisions of this Standard. If the inspection results are not in conformity with the provisions of this Standard, the Demander shall, within one month from the date of receipt of the products, propose to the Supplier for settlement through negotiation.

6.3 Batch: The anodes manufactured with the same batch of ingredients constitute a batch.

6.4 Check items

Product delivery inspection items

(1)Anode size check

(2)Anodic coating appearance inspection

(3)Check the bonding state of the anode coating surface

(4)Enhanced life test

(5)chemical composition analysis of the substrate

Enhanced life test due to a long cycle, so there is no data when leaving the factory (if the user needs to supplement later). Chemical composition analysis of the substrate is based on the feed material list.

6.5 Anode coating appearance inspection and anode size inspection shall be carried out on the anode product; Other test items to check the sample.

6.6 Checking decision rules

If the test piece inspection data does not conform to the technical index value of the factory inspection item, it is allowed to take a double number of test pieces from the sample to which the test piece belongs for reinspection of the unqualified item. If a sample still does not meet the requirements, the batch of anodes is disqualified.

7. Packaging, marking, storage and transportation

7.1 Signs

7.1.1 The following marks or labels shall be printed or affixed on qualified products:

a). The supplier's quality department checks and prints

b). Product brand

c). Batch number

d). Date

7.1.2 The following marks shall be marked on the product packaging:

a). Supplier label

b). Product name

c). Quantity

d). The anode should be gently put into the box, between the electrodes and between the electrodes and the packaging box, the use of soft foam board Isolation, firm, strictly prevent in the loading and unloading process of the electrode relative movement or due to bumps and jumping.

7. 2. 3 Storage and transportation

a). The product shall be handled with care in loading and unloading and transportation.

b). Do not roll or hit the package.

c). Wrap the product with soft material or wrapping paper before storage.

7.2.2 Certificate of Quality

Each batch should be accompanied by a product quality certificate, including:

a). Supplier name.

b). Product name.

c). Product brand, specification Product batch number, number of pieces.

d). The required analysis, inspection results and the seal of the quality department.

e). This standard No.

f). Packing (storage) date.