

ZINCOBRITE OH2

INTRODUCTION

Zincobrite OH2 has been developed to produce very bright zinc deposits with excellent distribution from a cyanide-free, alkaline solution.

The process does not contain complexing agents and rinse water can therefore be treated by simple neutralisation and precipitation, at pH 8-9. Alternatively, with suitable cascade rinsing, rinse water can be returned to the plating solution, as the process forms no detrimental decomposition products.

BENEFITS

- Excellent brightness
- Excellent deposit distribution
- Wide current density range
- Ductile deposits
- Recyclable rinses – zero zinc discharge
- Ease of control

SOLUTION MAKE-UP

	<u>Rack</u>	<u>Barrel</u>
Zinc oxide	14g/L	18.7g/L
Sodium hydroxide	120g/L	135g/L
Zincobrite OH2 Make-up Additive	15ml/L	20ml/L
Zincobrite OH2 Carrier	0.25ml/L	1ml/L
Zincobrite OH2 Purifier	1ml/L	1ml/L
Zincobrite OH2 Spray Suppressant	0.05ml/L	0.05ml/L

ZnOH2-06/04
ISSUE 3

OPERATING DATA

	<u>Rack</u>	<u>Barrel</u>
Zinc	9.5-17g/L (optimum 11g/L)	11-20.5g/L (optimum 15g/L)
Sodium hydroxide	90-150g/L (optimum 120g/L)	105-150g/L (optimum 135g/L)
Cathode current density	2.0-6.0 A/sq.dm.	0.5-1.0 A/sq.dm.
Anode current density	<2 A/sq.dm.	
Temperature	24-35°C (optimum 28°C)	
Deposition rate	Depends on current density etc (See NOTES)	

EQUIPMENT

Tanks	Polypropylene or polypropylene lined steel.
Heaters	PTFE or mild steel immersion with thermostatic control.
Cooling	Mild steel heat exchanger or cooling coil.
Filtration	Continuous recommended.
Agitation	Solution or work movement recommended for rack plating.
Anodes	(a) high purity zinc balls in mild steel cages, with polypropylene anode bags. (b) mild steel, in conjunction with an external zinc dissolving cell.

INSTALLATION

1. Clean the process tank with water then leach with a 50g/L solution of sodium hydroxide overnight, pumping through all filters, pumps and pipework. Pump out and rinse thoroughly with water.
2. Fill the tank approximately one quarter full with deionised water. Add the required amount of sodium hydroxide carefully with stirring.
3. While the solution is hot (80-90°C) add zinc oxide gradually and stir until dissolved. The hotter the solution the easier the dissolution.
4. Top up with deionised water to just short of final volume.
5. Cool the solution to approximately 30°C then add the calculated quantities of organic additives.
6. Add sufficient Zincobrite OH2 Spray suppressant to give the required foam blanket (less than 0.1ml/L required).
7. Electrolyse the solution at 1-2 A/sq.dm. for approximately 2 amp. hours/L.

MAINTENANCE AND CONTROL

The solution should be analysed regularly and replenished as necessary. (See analysis methods).

The addition rates for the organic additives will vary depending on the required brightness, drag-out etc, but the following can be used as a guide:-

Zincobrite OH2 Brightener	200-300ml/1000 amp hours
Zincobrite OH2 Carrier	50-75ml/1000 amp hours. This is usually only required in barrel installations.
Zincobrite OH2 Purifier	5-10ml/1000 Amp. hours.

NOTES OF THE USE OF ZINCOBRITE OH2

Zinc content	Zinc anodes should be removed when the solution is idle for extended periods (e.g. weekends) as chemical dissolution will occur.
--------------	--

Where mild steel anodes are used zinc content is maintained by holding some of the electrolyte in a reserve tank and dissolving zinc chemically from anode balls.

Temperature	For heavily worked baths cooling may be necessary.
-------------	--

**ZnOH2-06/04
ISSUE 3**

Deposition rate

Depending on current density and zinc concentration the cathode efficiency can vary between 50 and 90%. Lower zinc concentrations give reduced efficiency but better distribution.

As a guide, at a zinc concentration of 8g/L zinc and current density of 2 A/sq.dm. 0.5 μ will be deposited per minute.

ANALYSIS METHODS

1. Zinc

Reagents

0.1M EDTA

Eriochrome Black T indicator

Chloral hydrate

Ammonium chloride buffer solution -

dissolve 54gm ammonium chloride in 500ml deionised water. Add 350ml 0.88 S.G. ammonia and make up to 1 litre.

Method

1. Pipette a 5ml sample of the plating solution into a 500ml conical flask.
2. Add 25ml buffer solution, 25ml water, a trace Eriochrome Black T indicator and 1gm chloral hydrate.
3. Titrate with 0.1M EDTA to a blue end point.
4. Record titre = t mls.

Calculation

$$t \times 1.308 = \text{g/L zinc}$$

Replenishment

For every 1g/L zinc required add 1.24g/L zinc oxide

2. Sodium hydroxide

Reagents

1.0N hydrochloric acid

BDH 11-13 indicator

ANALYSIS METHODS CONTINUED

Method

1. Pipette a 5ml sample of the plating solution into a 500ml conical flask.
2. Add 50ml deionised water and a few drops BDH11-13 indicator.
3. Titrate with 1.0N hydrochloric acid to a yellow end point.
4. Record titre = t mls.

Calculation

$t \times 8.0 = \text{g/L sodium hydroxide}$

Replenishment

For every 1g/L required add 1g/L sodium hydroxide

**ZnOH2-06/04
ISSUE 3**

TROUBLE SHOOTING GUIDE

PROBLEM	REASON	REMEDY
Generally dull deposit	Lack of Brightener	Add 0.5-1.0ml/L Brightener
	Temperature too high	Cool solution
	Excess Brightener	Work out Brightener, add 1-2ml/L Purifier
	Solution Contamination	Add 1-2ml/L Purifier or 10ml/L sodium hypochlorite solution (12% active)
Dark, dull deposits at low C.D.	Low Purifier	Add 2ml/L Purifier
	Low Brightener	Add, after lab. test only, 0.25-0.5ml/L Brightener
	Metallic impurities	Plate out solution at 1-2 A/Sqdm
	Low sodium hydroxide	Analyse and correct
High C.D. burn	Zinc too high or too low	Correct as per analysis, reduce current density
	Temperature too low	Increase temperature
	Low Carrier	Add up to 0.15ml/L Carrier
Poor bright throwing power	Low sodium hydroxide	Analyse and correct
	Low Carrier	Add 0.1ml/L increments of Carrier
	Zinc too high	Plate down zinc content
	High temperature Brightener imbalance	Reduce temperature to 28°C add 0.1-0.2% Make-up Additive.
Poor zinc anode solubility	Anode C.D. too high	Increase zinc anode area
	Low sodium hydroxide	Analyse and correct
	Excessive use of Purifier	Reduce additions. Do not pour directly over anode.

DISPOSAL

Dispose of in accordance with local authority requirements.

PRODUCT FAMILIES

The following products are referred to in this data sheet.

<u>Product Name</u>	<u>Product Number</u>
Zincobrite OH2 Make-up Additive (25 Litre)	581010
Zincobrite OH2 Brightener (25 Litre)	581011
Zincobrite OH2 Carrier (25 Litre)	581012
Zincobrite OH2 Carrier (5 Litre)	581021
Zincobrite OH2 Purifier (25 Litre)	585003
Zincobrite OH2 Purifier (5 Litre)	585004
Zincobrite OH2 spray suppressant (5 Litre)	581013
Zinc oxide	M129

Whilst every endeavour has been made to ensure that the information given in this data sheet is correct, PMD (UK) gives no warranty, express or implied, relating to the use or performance of this product.