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PROVISIONAL SPECIFICATION.

IMPROVEMENTS IN OR RELATING TO AN ANODE MATERIAL FOR USE IN PRIMARY CELLS.

COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH, RAJF MARG, NEW DELHI 1, INDIA, AND 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 DR MICHAEL ANGELO VINCENT DEVANATHAN, Ceylon Citizen, Assistant Director Central Electrochemical Research Institute, Karaikudi-3 India, NARAYANAN RAMASAMY M Sc, Indian Citizen, Senior Scientific Assistant, Central Electrochemical Research Institute, Karaikudi-3, India, and SRINIVASAN VENKATESAN B Sc, Indian Citizen, Senior Laboratory Assistant, Central Electrochemical Research Institute, Karaikudi-3, India

This invention relates to improvements in or relating to an anode material for use in primary cells

Hitherto it has been proposed to use zinc as anode material and container in primary cells

This is open to the objection that utilisation of zinc for current generation rarely exceeds 25 per cent rest being used to contain the cathode

The object of this invention is to obviate these disadvantages by using manganese as anode in primary cells

To these ends, the invention broadly consists in using manganese metal as anode in primary cells with suitable amalgamation and electrolyte Any cathode depolariser can be used such as manganese dioxide, mercuric oxide, etc

The following typical examples are given to illustrate the invention

EXAMPLE 1

The metal is powdered and suitable mesh size is chosen It is amalgamated under controlled conditions and the powder is mounted or pressed on a conducting substrate This is used as anode in place of zinc in any of the primary cells

EXAMPLE 2

An electrolyte is so chosen that it has least parasitic corrosion on the metal and largest passivation time The cells are constructed using this electrolyte and the above-mentioned anode

The following are among the main advantages of the invention

1 The cells constructed with this metal anode show a voltage of 0.2V more than the corresponding zinc anode cells

2 As a consequence of the above advantage the number of cells needed for a high tension power pack is less

3 The power available from a cell is about 25 per cent higher than the conventional zinc anode cells

4 With a proper choice of a depolariser we can have a high performance cell using the new material as anode This will have a higher Watt-hour capacity

5 The use of zinc as container is obviated Thus wastage of zinc is avoided

6 The cost of a cell constructed with the new anode is competitive with that of zinc anode cells

7 The replacement of the zinc by the new anode material, the former is available for more useful purposes like the production of zinc base alloys

8 The amount of anode material needed is only about 25 per cent of that used in the conventional cells Consequently the cost of anode material is correspondingly reduced structural support being given by low cost materials as mild steel

9 Manganese ores are available in plenty and low grade ores can be usefully utilised for metal production

R. BHASKAR PAI

Patent Officer,

Council of Scientific, & Industrial Research

Dated this 24th day of August 1964

COMPLETE SPECIFICATION.

IMPROVEMENTS IN OR RELATING TO AN ANODE MATERIAL FOR USE IN PRIMARY CELLS.

COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH, RAJF MARG, NEW DELHI-1, INDIA, AND 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 MICHAEL ANGELO VINCENT DEVANATHAN, Assistant Director, Central Electrochemical Research Institute, Karaikudi-3, India, Ceylon Citizen, NARAYANAN RAMASAMY, M Sc, Senior Scientific Assistant, Central Electrochemical Research Institute, Karaikudi-3, India Indian Citizen and SRINIVASAN VENKATESAN, B Sc, Senior Laboratory Assistant Central Electrochemical Research Institute, Karaikudi-3, India, Indian Citizen

This invention relates to improvements in or relating to an anode material for use in primary cells

Hitherto it was proposed to use zinc as anode material and container in cells

This is open to the objection that the extent of utilisation of zinc is only 25 per cent rest being used to

contain the cathode

The object of this invention is to obviate these disadvantages by using manganese as anode in primary cells

To these ends, the invention broadly consists of a method for constructing primary cells characterised in that manganese suitably amalgamated and compacted is used as anode material

The following typical examples are given to illustrate the invention

EXAMPLE I.

The metallic manganese prepared electrolytically or otherwise is treated with acids so as to remove completely the adherent oxide film and amalgamated using

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a solution containing mercury salts in acid medium. Amalgamation is carried out under conditions or rigorous stirring so that the entire surface of the metal whether a sheet or flakes are amalgamated without any dark spot.

EXAMPLE 2.

The amalgamated manganese metal so obtained can be made powder compact by grinding, mixing with a suitable binder that does not introduced high resistance nor chemically reacts with the metal and pressing on a conducting substrate of iron or any other metal suitably plated to resist corrosion.

EXAMPLE 3.

The above compacted electrode or sheet electrode is used along with a cathode element in a solution of the halides of alkaline earth and alkaline metals with addition of certain inhibitors like chromate in suitable quantities. The latter acts as the electrolyte with very little corrosion of the metal and does not passivate the metal during the operation of the cell.

EXAMPLE 4.

The above mentioned anode and electrolyte can be coupled with any depolariser mixture to give primary cells of varying voltages. Thus with mercuric oxide cathode the cell gives a voltage of 1.4V, with manganese dioxide 1.75V, etc.

The following are among the advantages of the invention.

1. The cells constructed using manganese as anode give 0.2V higher voltage.
2. As a result of the above, the number of cells needed for high tension power packs is less.

3. This can be coupled with any cathodic depolariser mixture.

4. The metal can be obtained from low grade manganese ores available in plenty in India.

5. Cheaper MS cans can be used thereby avoiding the use of zinc as container.

6. As a result of very little corrosion and non-passivation in the electrolyte, the metal is also ideally suited for anodes in cathodic protection of static or moving structures.

We claim:

1. A method for constructing primary cells characterised in that manganese suitably amalgamated and compacted is used as anode material.

2. A method as claimed in Claim 1 wherein is used an electrolyte which causes least corrosion of the metal anode and which does not passivate the metal anode.

3. Primary cells constructed with anode metal according to Claim 1 and wherein the cathode consists of a depolariser such as mercuric oxide, manganese dioxide, cupric oxide.

4. A process for constructing primary cells substantially as hereinbefore described.

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Dated this 19th day of May 1965.