

Product name: Cylindrical Nickel-Metal Hydride Battery Cell

Establishment / Revision: Dec. 1, 2003

Reference number TW-CE-E01-01

Safety data sheet for chemical products (SDS)

1. PRODUCT AND COMPANY IDENTIFICATION

- Product name : Cylindrical Nickel-Metal Hydride Battery
- Company name : SANYO Electric Co., Ltd. Mobile Energy Company
- Address : 222-1 kaminaizen, Sumoto City, Hyogo, Japan
- Telephone number : +81-799-23-4111
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2. COMPOSITION / INFORMATION ON INGREDIENTS

- Substance or preparation : Preparation
- Information about the chemical nature of product :

Common chemical name / General name	CAS number	Concentration / Concentration range	Classification and hazard labeling
Hydrogen Absorbing Alloy	7440-02-0(Ni) 7440-48-4(Co) 7439-96-5(Mn) 7429-90-5(Al)	20-40%	Not applicable
Nickel-Cobalt-Zinc oxide	7440-02-0(Ni) 7440-48-4(Co) 7440-66-6(Zn)	15-25%	Not applicable
Nickel	7440-02-0	5-15%	Not applicable
Iron	7439-89-6	20-40%	Not applicable
Potassium Hydroxide	1310-58-3	0-15%	Corrosive substance Acute toxicity substance
Sodium Hydroxide	1310-73-2		
Lithium Hydroxide	1310-65-2		

3. HAZARDS IDENTIFICATION

For the battery cell, chemical materials are stored in a hermetically sealed metal case, designed to withstand temperatures and pressures encountered during normal use. As a result, during normal use, there is no physical danger of ignition or explosion and chemical danger of hazardous materials' leakage.

However, if exposed to a fire, added mechanical shocks, decomposed, added electric stress by misuse, the gas release vent will be operated. The battery cell case will be breached at the extreme. Hazardous materials may be released.

Moreover, if heated strongly by the surrounding fire, acrid or harmful fume may be emitted.

- Most important hazard and effects
Human health effects:

Cover the victim in a blanket, move to the place of fresh air and keep quiet. Seek medical attention immediately. When dyspnea (breathing difficulty) or asphyxia (breath-hold), give artificial respiration immediately.

• Skin contact :

Remove contaminated clothes and shoes immediately. Wash the adherence or contact region with soap and plenty of water. Seek medical attention immediately.

• Eye contact :

Immediately flush eyes with water continuously for at least 15 minutes. Seek medical attention immediately.

A battery cell and internal cell materials of an opened battery cell

• Ingestion :

Do not induce vomiting. Seek medical attention immediately.

5.FIRE-FIGHTING MEASURE

Although a battery cell is not flammability, in case of fire, move it to the safe place quickly.

The following measures are taken when it cannot be moved.

• Suitable extinguishing media: Dry sand, chemical powder fire extinguishing medium.

• Specific hazards: Acrid or harmful fume is emitted during fire.

• Special protective equipment for firefighters :

Respiratory protection: Protective mask

Hand protection: Protective gloves

Eye protection: Goggle or protective glasses designed to protect against liquid splashes

Skin and body protection: Protective cloth

6.ACCIDENTAL RELEASE MEASURES

Internal cell materials, such as electrolyte leaked from battery cell, are carefully dealt with according to the followings.

• Personal precautions :

Forbid unauthorized person to enter. Remove leaked materials with protective equipment written in Section 8.

• Environmental precautions: Do not throw out into the environment.

• Method of cleaning up :

Dilute the leaked electrolyte with water and neutralize with diluted sulfuric acid. The leaked solid is moved to a container. The leaked place is fully flushed with water.

7.HANDLING AND STORAGE

• Handling

Technical measures

Prevention of user exposure: Not necessary under normal use.

Prevention of fire and explosion: Not necessary under normal use.

Precaution for safe handling: Do not damage or remove the external tube.

Specific safe handling advice: Never throw out cells in a fire or expose to high temperatures. Do not

information below will be useful.

- Control parameters

Common chemical name / General name	ACGIH(1999)	
	TLV-TWA	BEI
Nickel, Nickel Compounds	(As Ni) Metal : 1.51mg/m ³ Soluble compounds : 0.1mg/m ³ Insoluble compounds : 0.2mg/m ³	-
Cobalt Compounds	(As Co) 0.02mg/m ³	In blood : 1 micro g/l
Manganese Compounds	(As Mn) 0.2mg/m ³	
Aluminum Compounds	(As Al) 0.2mg/m ³ (Flammable powder)	
Zinc Compounds	5mg/m ³ (ZnO Fume) 10mg/m ³ (ZnO Dust)	
Potassium Hydroxide	-	-
Sodium Hydroxide	-	-
Lithium Hydroxide	-	-

ACGIH: American Conference of Governmental Industrial Hygienists, Inc.

TLV-TWA: Threshold Limit Value-time weighted average concentration

BEI: Biological Exposure Indices

- Personal protective equipment

Respiratory protection: Protective mask

Hand protection: Waterproof protective gloves

Eye protection: Protective glasses designed to protect against liquid splashes

Skin and body protection: Working clothes with long sleeve and long trousers

9. PHYSICAL AND CHEMICAL PROPERTIES

- Appearance

Physical state: Solid

Form: Cylindrical

Color: Metallic color (without tube)

Odor: No odor

- pH : NA

- Specific temperatures/temperature ranges at which changes in physical state occur.

There is no useful information for the product as a mixture.

- Flash point : NA

- Explosion properties : NA

- Density : NA

- Solubility ,with indication of the solvent(s) : Insoluble in water

10. STABILITY AND REACTIVITY

Nickel, Nickel Compounds

- Acute toxicity: Unknown.
- Local effects :
Inhalation of dust particles causes a cough. Metallic nickel and nickel salt causes allergic erythema in skin contact and irritates conjunctiva and cornea in eye contact.
- Sensitization :
Repeated or prolonged contact with skin may cause dermatitis. Repeated or prolonged contact with skin may cause skin sensitization.
- Chronic toxicity/Long term toxicity :
Repeated or prolonged inhalation exposure may cause asthma. Lungs may be affected by repeated or prolonged exposure. The substance may have effects on the nasal sinuses, resulting in inflammation and ulceration.
- Carcinogenicity :
ACGIH: (Metal) A5 – Not suspected as a human carcinogen
ACGIH: (Insoluble compounds) A1 – Confirmed human carcinogen
NIOSH: Potential occupational carcinogen
NTP: Reasonably anticipated to be human carcinogens
IARC: (Metal) Group 2B Possibly carcinogenic to humans
IARC: (Compounds) Group 2B carcinogen

Cobalt Compounds

- Acute toxicity: Unknown.
- Local effects :
Oral ingestion in excess of cobalt salt causes face flush with antherma, reversible difficulty of hearing, the kidney dysfunction, hypertrophied thyroid gland, loss of appetite, nausea and vomiting.
Inhalation of metallic cobalt dust or fume (Cobalt oxide) affects respiratory tract membrane. Bronchitis and pneumonia will be caused in excess of inhalation.
Skin contact of metallic cobalt or cobalt salt causes allergic erythema and popular eczema.
- Metallic cobalt or cobalt salt irritate conjunctiva and cornea in eye contact.
- Sensitization: Repeated or prolonged contact may cause skin sensitization.
- Chronic toxicity/Long term toxicity :
Repeated or prolonged inhalation exposure may cause asthma. Lungs may be affected by repeated or prolonged exposure. The substance may have effects on the heart, resulting in cardiomyopathy.
- Carcinogenicity :
ACGIH: A3 – animal carcinogen
IARC: Group 2B Possibly carcinogenic to humans

Potassium Hydroxide, Sodium Hydroxide, Lithium Hydroxide

- Acute toxicity: Unknown.
- Local effects :
Oral ingestion irritates a mouth and a throat. Oral ingestion causes nausea, vomiting, hematemesis, stomach pains and diarrhea. Oral ingestion causes bronchial infection, pneumonia and gastritis.
Inhalation of dust or mist irritates respiratory tract. Inhalation of dust or mist may cause pneumonia and pulmonary edema.
Skin contact affects the skin seriously and may cause dermatitis.
- Eye contact affects the cornea and causes corneal ulcer. It may lead to blindness.

14. TRANSPORT INFORMATION

In the case of transportation, confirm no leakage and no over-spill from a container. Take in a cargo of them without falling, dropping and breakage. Prevent collapse of cargo piles and wet by rain. The container must be handled carefully. Do not give shocks that result in a mark of hitting on a cell. Please refer to Section 7-HANDLING AND STORAGE also.

15. REGULATORY INFORMATION

- Regulations specifically applicable to the product :
Wastes Management and Public Cleaning Law (Japan)
Law for Promotion Effective Utilization of Resources (Japan)

16. OTHER INFORMATION

- The information contained in this Safety data sheet is based on the present state of knowledge and current legislation.
- This safety data sheet provides guidance on health, safety and environmental aspects of the product and should not be construed as any guarantee of technical performance or suitability for particular applications.

- Reference

Chemical substances information: Japan Advanced Information center of Safety and Health
International Chemical Safety Cards (ICSCs):
International Occupational Safety and Health Information Center (CIS)
1999 TLVs and BEIs : American Conference of Governmental Industrial Hygienists (ACGIH)
NIOSH CARCINOGEN LIST: National Institute for Occupational Safety and Health (NIOSH)
The Ninth Report on Carcinogen: National Toxicology Program (NTP)
IARC Monographs Program on the Evaluation of Carcinogenic Risks to Humans:
International Agency for Research on Cancer (IARC)

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