

MATERIAL SAFETY DATA SHEET

1. IDENTIFICATION ON INGREDIENTS

A. PRODUCT NAME

LEAD-ACID BATTERIES

B. RECOMMENDED USE OF THE CHEMICAL AND RESTRICTIONS ON USE

Electric Storage Battery

C. MANUFACTURER/SUPPLIER/DISTRIBUTOR INFORMATION/MANUFACTURER

Discover Energy Corp.
Unit 4-13511 Crestwood Place,
Richmond, BC, Canada V6V 2E9
Tel: (778) 776-3288

2. HAZARD IDENTIFICATION ON INGREDIENTS

A. HAZARD CLASSIFICATION

PHYSICAL HAZARDS	Not Classified	
HEALTH HAZARDS	Carcinogenicity	Category 1B
	Specific target organ toxicity – single exposure	Category 2
	Specific target organ toxicity – repeated exposure	Category 1
	Acute toxicity (inhalation)	Category 4
	Skin corrosion/irritation	Category 1
	Serious eye damage/eye irritation	Category 1

B. PRECAUTIONARY STATEMENTS

HAZARD STATEMENTS

H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage
H330	Harmful if inhaled.
H341	Suspected of causing genetic defects
H350	May cause cancer (inhalation)
H370	Specific target organ toxicity – single exposure; Respiratory tract irritation. Causes damage to organs (Hematopoietic system, kidney, central nervous
H372	system, peripheral nervous system, cardiovascular system, immune system, respiratory).

PRECAUTIONARY STATEMENTS

[Prevention] P201	Obtain special instructions before use
P202	Do not handle until all safety precautions have been read and understood
P260	Do not breathe dust/fume/gas/mist/vapours/spray
P264	Wash hands thoroughly after handling
P270	Do not eat, drink or smoke when using this product
P271	Use only outdoors or in a well ventilated area
P280	Wear protective gloves/protective clothing/eye protection/face protection
P281	Use personal protective equipment as required
[Response] P301+P330+P331	IF SWALLOWED, Rinse mouth. DO NOT induce vomiting
P303+P361+P353	IF ON SKIN (or hair), Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340	IF INHALED, Remove victim to fresh air and keep at rest in a position comfortable for breathing
P305+P351+P338	IF IN EYES, Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P307+P311	IF EXPOSED, Call a POISON CENTER or a MEDICAL INSTITUTION (or doctor).
P308+P313	IF EXPOSED (or concerned), get medical advice/attention
P310	Immediately call a POISON CENTER or doctor/physician
P312	Call a POISON CENTER or doctor/physician if you feel unwell.
P314	Get medical advice/attention if you feel unwell
P321	Specific treatment (see ... on this label
P363	Wash contaminated clothing before reuse
[Storage] P405	Store locked up.
[Disposal] P501	Dispose of contents (or container) in accordance with local/regional/national regulations

C. OTHER HAZARDS WHICH DO NOT RESULT IN CLASSIFICATION. (NFPA)

Health: 3 Flammability: 0 Reactivity: 2
Sulfuric acid is water-reactive if concentrated

3. COMPOSITION / INFORMATION

Chemical name / Synonym	CAS No. or ID	Content (%)
Lead	7439-92-1	54 - 64
Antimony	7440-36-0	0.1 - 0.4
Sulfuric acid / Oil of vitriol	7664-93-9	30 - 37
Polypropylene / PP Resin	9003-07-0	6 - 10
Separator	Not available	1 - 2

4. FIRST AID MEASURES

A. EYE CONTACT

IF IN EYES, do not rub or scratch exposed eye. Immediately flush eyes with running water for at least 20 minutes, keeping eyelids open. Remove contact lenses, if present and easy to do. GET MEDICAL ATTENTION IMMEDIATELY.

B. SKIN CONTACT

IF ON SKIN (or hair), do not rub or scratch exposed skin. If liquid get on the skin, immediately flush the contaminated skin with water for at least 20 minutes. If liquid penetrate through the clothing, immediately remove the clothing and shoes under a safety shower and continue to wash the skin for at least 20 minutes. GET MEDICAL ATTENTION IMMEDIATELY.

C. INGESTION

IF SWALLOWED, rinse mouth. Vomiting may occur spontaneously, but DO NOT induce vomiting. Never give anything by mouth to an unconscious person GET MEDICAL ATTENTION IMMEDIATELY.

D. INDICATION OF IMMEDIATE MEDICAL ATTENTION AND NOTES FOR PHYSICIAN

Based on the individual reactions of the patient, the physician's judgment should be used to control symptoms and clinical condition.

5. FIRE FIGHTING MEASURES

A. SUITABLE (AND UNSUITABLE) EXTINGUISHING MEDIA

Use extinguishing media appropriate for surrounding fire. If a battery ruptures, use dry chemical, soda ash, lime, sand or carbon dioxide

B. SPECIFIC HAZARDS ARISING FROM THE CHEMICAL

Lead, lead compounds and sulfuric acid fume may be released during a fire involving the product.

C. SPECIAL PROTECTIVE EQUIPMENT AND PRECAUTIONS FOR FIRE FIGHTERS

Wear self-contained breathing apparatus (SCBA) and full fire-fighting protective clothing.

D. FIRE AND EXPLOSION HAZARD

Not flammable. Battery may rupture due to pressure buildup when exposed to excessive heat and may be result in the release of corrosive materials

6. ACCIDENTAL RELEASE MEASURES

A. NECESSARY MEASURES AND PROTECTIVE GEAR TO PROTECT HUMANS

If a battery ruptures, avoid contact with skin, eyes and clothing. Do not touch spilled material. Use personal protective equipment recommended in Section 8 (Exposure Controls/Personal Protection).

B. NECESSARY MEASURES TO PROTECT ENVIRONMENT

Notify authorities and appropriate federal, state, and local agencies. Prevent the product from spreading into the environment. Avoid direct discharge into drains

C. METHODS AND MATERIALS FOR CONTAINMENT AND CLEANING UP

Collect all released material in a plastic lined metal container. Absorb with dry earth, sand or other non-combustible material. If necessary neutralize the residue with a dilute solution of sodium carbonate. Wash affected area. In case of LARGE SPILLS, Dispose of all contaminated materials in accordance with current local regulations.

7. HANDLING AND STORAGE

A. PRECAUTIONS FOR SAFE HANDLING

Do not handling before reading a precautions. Protect from physical damage.

B. CONDITIONS FOR SAFE STORAGE (INCLUDING ANY INCOMPATIBILITIES)

Avoid contact with eyes. Store in a cool, dry, ventilated area away from sources of heat, moisture, incompatibilities, and direct sunlight. Have emergency equipment (for fires, spills, leaks, etc.) readily available.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

A. OCCUPATIONAL EXPOSURE LIMIT(S), BIOLOGICAL EXPOSURE STANDARD

OSHA-PEL	TWA 0.05 mg/m ³ (Lead), TWA 1 mg/m ³ (Sulfuric acid), TWA 0.5 mg/m ³ (Antimony)
ACGIH-TLV	TWA 0.05 mg/m ³ (Lead), TWA 1 mg/m ³ (Sulfuric acid), TWA 0.5 mg/m ³ (Antimony)

B. APPROPRIATE ENGINEERING CONTROLS

Use local exhaust ventilation if necessary to control airborne mist and vapor

C. INDIVIDUAL PROTECTION MEASURES

Respiratory protection	If significant mists or aerosols are generated an approved respirator is recommended. If respiratory protection is required, institute a complete respiratory protection program including selection, fit testing, training, maintenance and inspection.
Eye protection	Wear safety glasses with side shields (or goggles).
Hand protection	Wear chemical resistant gloves. Gloves should be replaced immediately if signs of degradation are observed.
Body protection	Use good work and personal hygiene practices to avoid exposure. Consider the provision in the work area of a safety shower and eyewash. Always wash thoroughly after handling chemicals.

9. PHYSICAL AND CHEMICAL PROPERTIES

A. APPEARANCE (PHYSICAL STATE, COLOUR etc.)	Off-white cloudy liquid with solid object
B. ODOR	Characteristics
C. ODOR THRESHOLD	Not available
D. pH	pH < 1 (Sulfuric acid)
E. MELTING POINT/FREEZING POINT	Not available
F. INITIAL BOILING POINT AND BOILING RANGE	Not available
G. FLASH POINT	Non-flammable
H. EVAPORATION RATE	Not available
I. FLAMMABILITY (SOLID, GAS)	Not applicable
J. UPPER/LOWER FLAMMABILITY OR EXPLOSIVE LIMITS	Non-flammable
K. VAPOR PRESSURE	Not available
L. SOLUBILITY	Not available
M. VAPOR DENSITY	Not available

N. SPECIFIC GRAVITY	Not available
O. PARTITION COEFFICIENT OF n-OCTANOL/WATER	Not available
P. AUTO-IGNITION TEMPERATURE	Not applicable
Q. DECOMPOSITION TEMPERATURE	Not available
R. VISCOSITY	Not available
S. MOLECULAR WEIGHT	Mixture

Note: These physical properties are typical values for this product.

A. APPEARANCE (PHYSICAL STATE, COLOUR, etc)	Bluish white, silvery gray
B. ODOR	None
C. ODOR THRESHOLD	Not available
D. pH	Not applicable
E. MELTING POINT/FREEZING POINT	327.5°C
F. INITIAL BOILING POINT AND BOILING RANGE	1740°C (1013 hPa)
G. FLASH POINT	Non-flammable
H. EVAPORATION RATE	Not applicable
I. FLAMMABILITY (SOLID, GAS)	Not applicable
J. UPPER/LOWER FLAMMABILITY OR EXPLOSIVE LIMITS	Non-flammable
K. VAPOR PRESSURE	1.33 hPa (973°C)
L. SOLUBILITY	Insoluble in water
M. VAPOR DENSITY	Not applicable
N. SPECIFIC GRAVITY	11.34 g/cm ³
O. PARTITION COEFFICIENT OF n-OCTANOL/WATER	Not applicable
P. AUTO-IGNITION TEMPERATURE	Not applicable
Q. DECOMPOSITION TEMPERATURE	Not applicable
R. VISCOSITY	Not applicable
S. MOLECULAR WEIGHT	207.2

Note: These physical properties are typical values for Lead(Pb).

10. STABILITY AND REACTIVITY

A. CHEMICAL STABILITY

Stable at normal temperatures and storage conditions.

B. POSSIBILITY OF HAZARDOUS REACTIONS

Hazardous polymerization will not occur.

C. CONDITIONS TO AVOID (STATIC DISCHARGE, SHOCK, VIBRATION etc.)

Overcharging. Sources of ignition. Mechanical impact. Contact with incompatible chemicals.

D. SUBSTANCES TO AVOID

If a battery ruptures, avoid contact with organic materials and alkaline materials.

E. HAZARDOUS DECOMPOSITION PRODUCTS

Lead, Lead compounds and sulfuric acid fumes may be released during a fire involving the product.

11. TOXICOLOGICAL INFORMATION

A. INFORMATION ON THE LIKELY ROUTES OF EXPOSURE

Inhalation	Corrosive. Severe irritation and burns.
Ingestion	Serious burns.
Eye	Tearing, redness, swelling, corneal damage, irreversible eye damage and severe burns.
Skin	Redness, swelling, burns and severe skin damage.

B. DELAYED AND IMMEDIATE EFFECTS AND ALSO CHRONIC EFFECTS FROM SHORT AND LONG TERM EXPOSURE ACUTE TOXICITY (POSSIBLE ROUTE OF EXPOSURE)

Oral (LD50)	Rat	2140 mg/kg (Sulfuric acid)
		7000 mg/kg (Antimony)
Skin (LD50)	Not available	
Inhalation (LC50)	Rat	0.347 mg/L(4hr) (dust/mist)
Skin corrosion/irritation	cat 1	
Serious eye damage/irritation	cat 1	
Respiratory sensitization	Not available	
Skin sensitization	Not available	
Carcinogenicity	cat 1B	
	ACGIH Group A2, IARC Group 1 (Mist containing sulfuric acid)	
* Note	Sulfuric acid mist is not expected under normal use of the product. ACGIH Group A3, IARC Group 2B (Lead), IARC Group 3 (Polypropylene)	
Germ cell mutagenicity	cat 2	
Reproductive toxicity	Not available	
STOST-single exposure	Respiratory	cat 1
STOST-repeated exposure	cat 1	
	Hematopoietic system, kidney, central nervous system, peripheral nervous system, cardiovascular system, immune system, respiratory	
Aspiration hazard	Not available	

C. NUMERIC MEASURE OF TOXICITY (SUCH AS ACUTE TOXICITY ESTIMATES) - ATE_{mix}

Oral (LD50)	Rat	> 5,000 mg/kg
Skin (LD50)	Not available	
Inhalation (LC50)	Rat	2.51 mg/L(4hr) (dust/mist)

12. ECOLOGICAL INFORMATION

A. Aquatic/terrestrial ecology toxicity

Fish (LC50)	Not available
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Daphnia (EC50)	Not available
Algae (EC50)	Not available
B. Persistence and degradability	
Persistence	Not available
Degradability	Not available
C. Bioaccumulative potential	
D. Mobility in soil	
E. Other hazardous effects	

13. DISPOSAL CONSIDERATIONS

A. DISPOSAL METHODS

Dispose of in accordance with local, state, and federal regulations. Hazardous wastes must be transported by a licensed hazardous waste transporter and disposed of or treated in a properly licensed hazardous waste treatment, storage, disposal or recycling facility. Consult local, state, and federal regulations for specific requirements.

B. PRECAUTIONS (INCLUDING DISPOSAL OF CONTAMINATED CONTAINER OR PACKAGE)

Since emptied containers retain product residue, follow label warnings even after container is emptied.

14. TRANSPORT INFORMATION

The information in this section is for reference only and should not take the place of a shipping paper (BL). Please note that the proper Shipping Name / Hazard Class may vary by packaging, properties, and mode of transportation.

A. UN NUMBER	UN 2794
B. UN PROPER SHIPPING NAME	Battery, wet, filled with acid
C. TRANSPORT HAZARD CLASS(ES)	8
D. PACKING GROUP (IF APPLICABLE)	III
E. MARINE POLLUTANT SUBSTANCES (APPLICABLE/NOT APPLICABLE)	Not Applicable
F. SPECIAL PRECAUTIONS FOR USER	Not Applicable

15. REGULATORY INFORMATION

INVENTORIES

EINECS/EU	Listed (EINECS No. 231-100-4(Lead), 231-639-5(Sulfuric acid))
TSCA/US	Listed
ENCS/JAPAN	Listed (ENCS No. 1-527(Lead), 1-430(Sulfuric acid))
AICS/AUSTRALIA	Listed
DSL/CANADA	Listed
IECSC/CHINA	Listed
PICCS/PHILIPPINES	Listed
ECI/S.KOREA	Listed (KE-21887(Lead), KE-32570(Sulfuric acid))

INTERNATIONAL ENVIRONMENTAL AGREEMENT

PIC	Not listed
POPs	Not listed

Ozone depletion	Not listed
EU. Directive 67/548/EEC on the classification, packaging, and labeling of dangerous substances, Annex1	
Classification	R35
Risk Phrases	R35
Safety Phrases	S1/2, S26, S30, S45
U.S. Federal, Health and Environment) and U.S. Federal, Right-To-Know	
CERCLA Section 103 (40 CFR 302.4)	10lb (4.535 kg) (Lead), 1000 lb (453.599 kg) (Sulfuric acid)
EPCRA (SARA Title III) Section 302 (EHS -TPQ)	1000 lb (453.599 kg) (Sulfuric acid) EPCRA
(SARA Title III) Section 304 (EHS - Reporting Quantities)	1000 lb (453.599 kg) (Sulfuric acid)
EPCRA (SARA Title III) Section 313 - Toxic chemical release reporting	Sulfuric acid (acid aerosols including mists, vapors, gas, fog, and other airborne forms of any particle size)
OSHA Specifically Regulated Substances (29 CFR 1910.1001-.1052)	Not applicable.
CANADA REGULATORY INFORMATION	WHMIS Ingredient Disclosure List : Regulated

NOTE: The regulatory information given above only indicates the principal regulations specifically applicable to the product described in the Safety Data Sheet. The user's attention is drawn to the possible existence of additional provisions which complete these regulations. Refer to all applicable national, international and local regulations or provisions.

16. OTHER INFORMATION

A. SOURCE OF DATA

Guideline for Globally Harmonized System of Classification and Labelling of Chemicals (GHS).
 EC-ECB, International Uniform Chemical Information Database (IUCLID)
 Hazardous Substances Data Bank (HSDB)
 Registry of Toxic Effects of Chemical Substances (RTECS)
 National Institute of Technology and Evaluation -NITE (Japan)
 NFPA 704 Standard System for the Identification of the Hazards of Materials for Emergency Response.
 International Chemical Safety Cards(ICSC)(<http://www.nihs.go.jp/ICSC>)
 3E Company/Ariel WebInsight DB.

B. THE DATE OF PREPARATION OF THE MSDS

June 30, 2015

C. THE NUMBER OF TIMES REVISED AND THE DATE OF PREPARATION OF THE LATEST REVISION

Second preparation.

D. OTHER INFORMATION

The above information is believed to be correct but does not propose to be all inclusive and shall be used only as a guide. Discover Energy Corp. shall not be held liable for any damage resulting from handling or from contact with the above product. Each individual should make a determination as to the suitability of the information for their particular purpose(s). Various government agencies may have specific regulations regarding the transportation, handling, storage, use, or disposal of this product which may not be covered by this MSDS. The user is responsible for full compliance.