

**SYNERGY SCIENTECH CORP. -- Advanced Hybrid Batteries**

***SAFETY DATA SHEET***

Manufacturer's CAGE: SYNERGY

Part No. Indicator: A

Part Number/Trade Name: [AHB Series- Lithium ion Polymer batteries.](#)

1. General Information

Company's Name: SYNERGY SCIENTECH CORP.

Company's Street: 7F, No. 9, Park Ave. II, Hsinchu Science Park, Hsinchu, Taiwan 30075 R.O.C.

Company's City: HSIN-CHU, TAIWAN

Company's Emerge Ph #: 886-3-564-3700

Company's Info Ph #: 886-3-564-3700

Record No. For Safety Entry: 001

Tot Safety Entries This Sty #: 001

Status: SMJ

Date MSDS Prepared: January 1, 2020 (13<sup>th</sup> Edition)

Safety Data Review Date: January 1, 2020

MSDS Preparer's Name: Dr. Brian Shen

Preparer's Company: SAME

MSDS Serial Number: LIASN

2. Hazards Identification

Signal word



Route of Entry - Inhalation: YES

Route of Entry - Skin: YES

Route of Entry - Ingestion: YES

Health overexposure Acute and Chronic: UNDER NORM CNDTNS OF USE, THESE CHEMICALS ARE CONTAINED IN SEALED CAN. RISK OF EXPOS OCCURS ONLY IF BATTERY IS MECHANICALLY ABUSED. ACUTE: INHAL: CONTENTS OF OPENED BATTERY CAN CAUSE CONTENTS OF OPENED BATTERY CAN CAUSE IRRIT.

Carcinogenicity - NTP: NO

Carcinogenicity - IARC: NO

Carcinogenicity - OSHA: NO

### 3. Composition/information on ingredients

| Material Name.<br>(e.g. Sn alloy) | Substance Name (e.g. Copper (Cu)) | CAS No.    | Percentage (%) |
|-----------------------------------|-----------------------------------|------------|----------------|
| active material                   | LiCoO <sub>2</sub>                | 12190-79-3 | 32.62          |
| Binder-PVDF                       | Polyvinylidene difluoride         | 24937-79-9 | 1.04           |
| Conductive material               | Carbon                            | 1333-86-4  | 0.78           |
| Conductive material               | Carbon                            | 1333-86-4  | 0.26           |
| Foil                              | Aluminum                          | 7429-90-5  | 4.61           |
| active material                   | Carbon                            | 1333-86-4  | 15.92          |
| Binder-PVDF                       | Polyvinylidene difluoride         | 24937-79-9 | 1.3            |
| conductive material               | Carbon                            | 7440-44-0  | 0.09           |
| additive                          | Oxalic acid                       | 144-62-7   | 0.05           |
| foil                              | Copper                            | 7440-50-8  | 7.87           |
| electrolyte-solvent               | Ethylene carbonate                | 96-49-1    | 5.06           |
| electrolyte-solvent               | Diethyl carbonate                 | 105-58-8   | 3.72           |
| electrolyte-solvent               | Ethyl methyl carbonate            | 623-53-0   | 3.74           |
| electrolyte-additive              | Lithium hexafluorophosphate       | 21324-40-3 | 1.82           |
| electrolyte-additive              | 1,3-propanesultone                | 1120-71-4  | 0.09           |
| separator                         | Polyethylene                      | 9002-88-4  | 3.62           |
| tape-film                         | Polyimide                         | 75-55-8    | 0.1            |
| tape-adhesive                     | Acrylic                           | 9011-14-7  | 0.03           |
| tape-film                         | Polyester                         | 25038-59-9 | 0.14           |
| tape-adhesive                     | Acrylic                           | 9011-14-7  | 0.03           |
| Al bag                            | Nylon                             | 32131-17-2 | 3.85           |
| Al bag                            | Aluminum                          | 7429-90-5  | 9.75           |
| Al bag                            | Polypropylene                     | 9003-07-0  | 2.57           |
| tab lead                          | Nickel                            | 7440-02-0  | 0.38           |
| tab lead                          | polypropylene                     | 9003-07-0  | 0.05           |
| tab lead                          | Aluminum                          | 7429-90-5  | 0.24           |
| tab lead                          | polypropylene                     | 9003-07-0  | 0.05           |
| tab                               | Nickel                            | 7440-02-0  | 0.22           |

### 4. First Aid Measures

Explanation Carcinogenicity: NOT RELEVANT.

Signs/Symptoms of Overexposure: SEE HEALTH HAZARDS.

Med Cond Aggravated By Exp: NONE SPECIFIED BY MANUFACTURER.

WASH WITH SOAP AND WATER. EYES: IMMEDIATELY FLUSH THOROUGHLY WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES. SEEK MEDICAL ATTENTION.

INGESTION: CALL MD IMMEDIATELY (FP N).

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## 5. Fire Fighting Measures

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Extinguishing Media: IN CASE OF FIRE, USE CARBON DIOXIDE OR DRY CHEMICAL EXTINGUISHERS.

Special Fire Fighting Proc: WEAR NIOSH APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FPN).

Unusual Fire And Expel Hazards: NONE SPECIFIED BY MANUFACTURER.

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## 6. Accidental Release Measures

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Wear appropriate personal protective equipment. Isolate hazard area. Keep unnecessary and unprotected personnel from entering.

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## 7. Handling and Storage

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Wear suitable chemical resistant gloves, safety glasses and filtered cartridge respirator. Goggles, full face protection and other protective clothing is required if potential exists for direct exposure to liquid battery electrolyte.

In case Material is released or spilled: Carefully recover spillages with appropriate ladle and transfer to a suitably labeled, sealable container for safe disposal. Wash the spillage area neutralized with calcium hydroxide.

Wear suitable personal protection during removal of spillages.

Be stored in clearly labeled, tightly closed exclusive containers in a cool, dry area.

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## 8. Exposure Controls/Personal Protection

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Ventilation: Use local exhaust.

Protective Gloves: Wear rubber or plastic gloves.

Eye/Face Protection: Wear safety glasses, goggles or full face protections.

Respiratory Protection: Wear filtered cartridge respirator or a respirator of greater protection.

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## 9. Physical and Chemical Properties

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Product Type: Solid

Appearance: Prismatic

Odor: Odorless

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### 10. Stability and Reactivity

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Stability: YES

Cond To Avoid (Stability): NONE SPECIFIED BY MANUFACTURER.

Materials To Avoid: NONE SPECIFIED BY MANUFACTURER.

Hazardous Decamp Products: NONE SPECIFIED BY MANUFACTURER.

Hazardous Poly Occur: NO

Conditions To Avoid (Poly): NOT RELEVANT.

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### 11. Toxicological Information

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In case electrolyte is spilled and explored with air, the HF could be released.

May include hydrogen fluoride and carbon oxides gas.

May cause skin and eye irritation when contacted.

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### 12. Ecological Information

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If the battery scrapped, it should be selected and disposed by professional company.

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### 13. Disposal Consideration

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Disposal should be in accordance with local, state or national legislation.

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### 14. Transport Information

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Limit per package

\* Shipment Requirements 30%SOC

\*Equal to or less than 2.7Wh=2.5kg ; or Greater than 2.7Wh but equal to or less than 20Wh=8 cells , or Greater than 2.7 but equal to less than 100Wh=2 batteries.

\*Limit of 8 Cells/ 2 batteries per package or overpack.

\*Only 1 package containing Section II batteries Of UN 3480 may be included in any overpack or consignment.

| UN 38.3 Lithium Battery |                        | Test results | Remarks                                                               |
|-------------------------|------------------------|--------------|-----------------------------------------------------------------------|
| NO                      | Test item              | OK           | Test 1 to 5 must be conducted in sequence on the same cell or battery |
| T1                      | Altitude simulation    | OK           |                                                                       |
| T2                      | Thermal test           | OK           |                                                                       |
| T3                      | Vibration              | OK           |                                                                       |
| T4                      | Shock                  | OK           |                                                                       |
| T5                      | External short circuit | OK           |                                                                       |
| T6                      | Impact                 | OK           |                                                                       |
| T7                      | Overcharge             | OK           | Only battery do need this test item                                   |
| T8                      | Forced discharge       | OK           | For cell only                                                         |

The product is not classified as dangerous under the current edition of the 61<sup>th</sup> Edition IATA dangerous goods regulations. The products are safe for air transportation and not regulated by IATA DGR. Also they comply with the PI-965 to PI-967 Section II accordingly.

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### 15. Regulatory Information

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See ACGIH exposure limits information as noted in Section 3.

US: This MSDS meets/exceeds OSHA requirements

International: this MSDS conforms to European Union (UN), the International Standards Organization (ISO) and the International Labor Organization (ILO) and as documental in ANSI (American National Standards Institute) Standard Z400.1-1993.

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### 16. Other Information

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#### Reference:

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International Chemical Safety Cards (ICSCs): International Occupational Safety and Health  
Information Centre (CIS)

2002 TLVs and BELs: American Conference of Governmental Industrial Hygienists (ACGIH)  
Dangerous Goods Regulations-61<sup>th</sup> Edition : International Air Transport  
Association (IATA)

IMDG Code-2018 Edition: International Maritime Organization (IMO)

Latest covered modification of the European Battery Directive 2006/66/EC and Amendment  
2013/56/EU

The United Nations Economic Commission for Europe (UNECE)

MSDS of raw materials prepared by the manufactures

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## 13. Disposal Consideration

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## 14. Transport Information

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With regard to transport, the following regulations are cited and considered:

- The International Civil Aviation Organization (ICAO) Technical Instructions, Packing Instruction 965, Section I B or II (2019-2020 Edition),

The International Air Transport Association (IATA) Dangerous Goods Regulations, Packing Instruction 965, Section I B or II (61<sup>th</sup> Edition, 2020)

- The International Maritime Dangerous Goods (IMDG) Code (2018 Edition),

[Special provision 188, 230]

- US Hazardous Materials Regulations 49 CFR(Code of Federal Regulations)

Sections 173.185 Lithium batteries and cells,

- The UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria 38.3 Lithium batteries, Revision 3, Amendment 1 or any subsequent revision and amendment applicable at the date of the type (latest version is Revision 5, Amendment 2)

- UN No. 3480

If those lithium-ion batteries are packed with or contained in an equipment, then it is the responsibility of the shipper to ensure that the consignment are packed in compliance to the latest edition of the IATA Dangerous Goods Regulations section II of either Packing Instruction 966 or 967 in order for that consignment to be declared as NOT RESTRICTED (non-hazardous/non-Dangerous). If those lithium-ion batteries are packed with or contained in an equipment, UN No. is UN3481

Our products are properly classified, described, packaged, marked, and labeled, and are in proper condition for transportation according to all the applicable international and national governmental regulations, not limited to the above mentioned. We further certify that the enclosed products have been tested and fulfilled the requirements and conditions in accordance with UN Recommendations (T1 – T8) on the Transport of Dangerous Goods Model Regulations and the Manual of Testes and Criteria.

| UN 38.3 Lithium Battery |                        | Test results | Remarks                                                               |
|-------------------------|------------------------|--------------|-----------------------------------------------------------------------|
| NO                      | Test item              | OK           | Test 1 to 5 must be conducted in sequence on the same cell or battery |
| T1                      | Altitude simulation    | OK           |                                                                       |
| T2                      | Thermal test           | OK           |                                                                       |
| T3                      | Vibration              | OK           |                                                                       |
| T4                      | Shock                  | OK           |                                                                       |
| T5                      | External short circuit | OK           |                                                                       |
| T6                      | Impact                 | OK           |                                                                       |
| T7                      | Overcharge             | OK           | Only battery do need this test item                                   |
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Dangerous Goods Regulations-61<sup>th</sup> Edition : International Air Transport  
Association (IATA)

IMDG Code-2018 Edition: International Maritime Organization (IMO)

The European Agreement concerning the International Carriage of Dangerous Goods by Road-2015:

The United Nations Economic Commission for Europe (UNECE)

MSDS of raw materials prepared by the manufactures