SAFETY DATA SHEET

Revised Date: March 27, 2017

1 IDENTIFICATION

Chemical name: Lithium Nickel Cobalt Aluminum Boron Oxide
Product Use/Restrictions: Lithium Ion Battery Cathode Material

Product name: NAT-7051

Company name: TODA AMERICA, INC.
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2 HAZARD IDENTIFICATION

GHS classification:

Causes severe skin burns and eye damage (H314): **Hazard category 1C**

Hazard symbols:

Signal word: Danger

Hazard statements:

Causes severe skin burns and eye damage (H314)

Precautionary statements:

Prevention:
P260: Do not breathe dust or mists.
P264: Wash thoroughly after handling.
P271: Use only outdoors or in a well-ventilated area.
P280: Wear protective gloves/protective clothing/eye protection/face protection.

Response:
P304 + P340 IF INHALED: Remove Person to fresh air and keep comfortable for breathing.
P310: Immediately call a POISON CENTER or doctor.
P301+ P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353 IF ON SKIN (or hair): Takeoff immediately all contaminated clothing. Rinse skin with water [or shower].
P363 Wash contaminated clothing before reuse.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P314: Get medical attention/advice if you feel unwell.

Storage:
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P405: Store locked up.

Disposal
P501: Dispose of contents/container in accordance with local/regional/national/international regulation.

3 COMPOSITION/INFORMATION ON INGREDIENTS

Composition	Mixture
Chemical name	Lithium Nickel Cobalt Aluminum Boron Oxide
Chemical formula	$LiNi_{0.8}Co_{0.15}Al_{0.05}O_{1.985}(BO_3)_{0.01}$

Ingredient and information

Chemical formula	Li_2O	Ni_2O_3	Co_2O_3	Al_2O_3	B_2O_3
CAS No.	12057-24-8	1314-06-3	1308-04-9	1344-28-1	1303-86-2
TOSCAINVENTORY	Listed	Listed	Listed	Listed	Listed
CONTENT (wt %)	14-17	64-74	11-14	1-3	0.2-0.4

Concentration or concentration range ＞98wt%

4 FIRST-AID MEASURES

IF INHALED: Remove Person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or doctor.

IF ON SKIN (or hair): Take off immediately all contaminated clothing.

Rinse skin with water [or shower]. Call a POISON CENTER or doctor if necessary.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a POISON CENTER or doctor if necessary.

IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. Immediately call a POISON CENTER or doctor.

5 FIRE-FIGHTINGMEASURES

This product is not flammable. Suitable extinguishing media corresponding to the situation of a fire in the surrounding area should be used.

Unsuitable extinguishing media:

Avoid pouring water directly onto the product.

6 ACCIDENTALRELEASE MEASURES

Personal precautions, protective equipment and emergency procedures:

Wearing of suitable protective equipment (including personal protective equipment, (see Section 8 of the SDS) to prevent any contamination of skin, eyes and personal clothing.

Remove ignition sources and provide sufficient ventilation and emergency procedures needed to evacuate the danger area, or consult an expert.

Environmental precautions:

Do not discharge into the drains/surface waters/groundwater. Do not discharge into the subsoil/soil.

Methods and materials for containment and cleaning up:

Pick up mechanically, avoiding dust, and provide disposal in suitable recipients.

7 HANDLINGAND STORAGE

Precautions for safehandling:

Safe handling of the mixtures, prevent handling of incompatible mixtures and minimize the release of the mixture to the environment. Wash hands after use. Remove contaminated clothing and protective equipment before entering eating areas.

Conditions for safe storage, including any incompatibilities:

Keep only in original container. Keep container tightly closed in a dry, cool and well-ventilated place. Protect from moisture. Protect from heat and direct solar radiation. Keep under lock and key or accessible only to specialists or people authorized by them.

8 EXPOSURE CONTROLS/PERSONALPROTECTION

Control parameters:

Ni	OSHA:TWA1mg (Ni)/m^3
	ACGIH: TWA1.5mg (Ni) / m^3
Co	OSHA:TLV-TWA(8Hr) (COBALTDUST and FUME): 0.1mg / m^3
	ACGIH: TLV-TWA(8Hr) (COBALTDUST and FUME): 0.02mg / m^3
Al	ACGIH: TLV-TWA(8Hr) (Aluminum Oxide): 10mg / m^3

Protective and hygiene measures：

Do not breathe dust. Avoid contact with eyes and skin. Wash hands before breaks and immediately after handling the product. Takeoff immediately all contaminated clothing.

Appropriate engineering controls：

Use local exhaust ventilation (use only in an enclosed system）

Use explosive dust handling controls

Individual protection measures：

Each person who is reasonably likely to be exposed to the chemical (or a mixture including more than 0.1 percent of the chemical) by dermal contact or inhalation (including airborne forms of dust, mist, fume, smoke, vapor or gas) is required to wear personal protective equipment that provides a barrier to prevent dermal exposure and respirator. Personal protective equipment and respirators must meet the following qualifications:

Skin Protection: gloves and bodysuit that provide an impervious barrier to prevent dermal contact during normal or expected duration of conditions and exposure, shown through either testing or evaluation of specification from the supplier of the personal protective equipment.

Eye Protection: tight fitting full face-piece or hood used with respirator (designated below).

Respirator: Respirators must provide a National Institute for Occupational Safety and Health (NIOSH) assigned protection factor (APF) of at least 150. Supplied-air respirators operated in positive pressure demand or other positive pressure mode and equipped with a tight-fitting full facepiece (or hood) will meet this requirement.

9 PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties：

Appearance (physical state, color):	Solid black powder (Inorganic)
Odor:	odorless
pH:	≒11.5 (2% solution)
Melting point:	> 1000 °C
Initial boiling point/boiling range:	not applicable
Flash point:	not applicable
Evaporation rate:	not applicable
Flammability:	not flammable
Lower combustion/explosion limits:	not combustive/explosive
Upper combustion/explosion limits:	not combustive/explosive
Vapor Pressure:	no data
Vapor Density:	no data
Relative Density:	no data
Solubility:	Insoluble
Partition coefficient: n-octanol/water:	no data
Auto ignition temperature:	not applicable
Decomposition temperature:	> 1000°C
Viscosity:	no data
Powder Density (at 20 °C):	1.2～2.8 g/cm^3

10 STABILITYAND REACTIVITY

Reactivity, Chemical stability：	Stable under normal conditions.
Possibility of hazardous reactions：	Not known.
Conditions to avoid：	Stable under normal conditions.
Incompatible materials：	Protect from moisture. Protect from heat and direct solar radiation.
Hazardous decomposition products：	No decomposition if stored and applied as directed.

11 TOXICOLOGICALINFORMATION

Acute toxicity:	OECD403 LC50 Not Toxic
Skin corrosion/irritation:	OECD404 positive
Serious eye damage/irritation:	Product may cause irreversible eye injuries.
Respiratory or skin sensitization:	Causes strong corrosion.
Germ cell mutagenicity:	No dataavailable.
Carcinogenicity:	Nickel Compound (Class 1): IARC Category 1, ACGIH A1 (insolubility), Japan Society for Occupational Health 1. Cobalt and its inorganic compounds (Class 2): IARC Category 2B, ACGIH A3, Japan Society for Occupational Health 2B.
Reproductive Toxicity:	Boron oxide: Cat.2;R60-61（EU-AnnexI）GHSCategory1B
STOST-single exposure:	Cobalt: Inhibits liver function, ATSDR (2004 Edition).
STOST-repeated exposure:	NOEL (Oral, Rat): 50 mg/kg Cobalt: Inhibits respiratory function, ATSDR (2004 Edition).
Aspiration Hazard:	No dataavailable.

12 ECOLOGICAL INFORMATION

Toxicity:	No data available.
Persistence and degradability:	No dataavailable.
Bio accumulative potential:	No dataavailable.
Mobility in soil:	No dataavailable.
Results of PBT and vPvB assessment:	No dataavailable.

13 DISPOSALINFORMATION

Ensure disposal of contents/container in accordance with local/regional/national/international regulation

14 TRANSPORT INFORMATION

International regulation:

IMDG/ICAO/IAT

UN number:	3262
Proper Shipping Name:	Corrosive solid, basic, inorganic, N.O.S. (Lithium Nickel Cobalt Aluminum Boron Oxide)
Hazard class:	8
Packing Group:	III

Hazard label:

15 REGULATORYINFORMATION

Nothing herein is to be taken as a license to operate under or a recommendation to infringe any patents. Any use of these data and information must be determined by the user to be in accordance with Federal, state and local laws and regulations.

16 OTHER INFORMATION

The data in this SDS relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

The information set forth herein is based on technical data that TODA AMERICA, INC. believes to be reliable. It is intended for use by persons having technical skill and at their own discretion and risk. Since conditions of use are outside our control, we make no warranties, expressed or implied, and assume no liability in connection with any use of this information.

Revision History:

8/11/2015:

§1: Added Use/Restriction.

§9: Added reference to: Odor threshold, freezing point, evaporation rate, flammability, upper/lower explosive limits, partition coefficient and auto ignition temperature.

9/01/2015:

§14: Revised proper shipping name to:

Toxic solid, corrosive, inorganic, N.O.S. (Lithium Nickel Cobalt Aluminum Boron Oxide)

From:

Corrosive Solid, Toxic, N.O.S.

10/20/2015

§2: Removed: Fatal if inhaled (H330): Hazard category 2 and pictogram (based on test results).
Removed: Toxic if inhaled（dust) hazard statement (based on test results).

§11: Revised: Acute toxicity: OECD403 LD50 0.5 to 1.0 (mg/l)(dust) to
OECD403 LC50 Not Toxic (based on test results).

§14: Revised: UN number 3290 to UN number 3262 (based on test results)
Revised: Hazard class Hazard class 6.1 to 8 with no subsidiary risk (based on test results).
Revised: Packing Group 1 to Packing Group III (based on test results)
Revised: Proper shipping name from:
Toxic solid, corrosive, inorganic, N.O.S. (Lithium Nickel Cobalt Aluminum Boron Oxide)
To:
Corrosive solid, basic, inorganic, N.O.S. (Lithium Nickel Cobalt Aluminum Boron Oxide)
(Based on test results)
Removed: DOT Placard symbol for class 6 (based on test results)

11/4/2016

§9: Standardized according to 29CFR 1910:1200 All properties required to be listed are indicated and responded to.

03/27/2017

§8: Clarified requirements for PPE.