www.material-sys.com

TOSHIMA Manufacturing

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2018 VOL.1

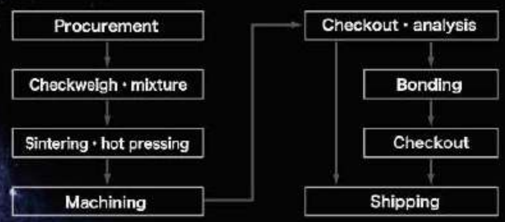
Lithium-ion Battery Materials
Ferroelectric Materials
Functional Materials

Contents

Total Support For Advanced Material Research

Materials system division of Toshima manufacturing company supports your advanced study and development with providing a variety of materials following your requests.
We can materialize it with short lead time thanks to total in-house production system.

PRODUCTION PROCESS



Lithium-ion battery materials

We can provide powder, sputtering target for thin film or sheet types of Lithium ion battery materials.

POWDERS

Production method

Solid-solid reaction, Sol-gel method, Co-precipi-tation

TARGETS

Uses

for Sputtering, PLD etc.

SHEETS

Substrate use

10x10x0.5t, ϕ10x0.5t etc.

※The relative density of LLZ is over 95%.

Cathode active materials	$LiCoO_2$	$LiNiO_2$	$LiFeO_2$	$LiCo_{1/3}Ni_{1/3}Mn_{1/3}O_2$
	$LiNi_{0.8}Co_{0.15}Al_{0.05}O_2$	Li_2MnO_3	$Li_2Mn_2O_4$	$LiMn_2O_4$
	$LiCo_{0.5}Mn_{1.5}O_4$	$LiNi_{0.5}Mn_{1.5}O_4$	$LiFePO_4$	$LiCoPO_4$
	$LiNiPO_4$	$LiMnPO_4$	$LiCo_{1-x}Fe_xPO_4$	
Solid electrolyte materials	$Li_{6.25}La_3Zr_2Al_{0.25}O_{12}$	$Li_{6.6}La_3Zr_{1.6}Ta_{0.4}O_{12}$	$Li_{6.75}La_3Zr_{1.75}Nb_{0.25}O_{12}$	$Li_{6.25}La_3Zr_2Ga_{0.25}O_{12}$
	$Li_5La_3Ta_2O_{12}$	$Li_{0.33}La_{0.55}TiO_3$	$Li_{1.5}Al_{0.5}Ge_{1.5}P_3O_{12}$	$Li_{1.3}Al_{0.3}Ti_{1.7}P_3O_{12}$
	Li_3PO_4(LIPON)	Li_4SiO_4	Li_3PO_4-Li_4SiO_4	Li_3BO_3
Anode materials	$Li_4Ti_5O_{12}$			
Other related materials	$LiNbO_3$	Na_3PO_4	$Na_3Zr_2Si_2PO_{12}$	

Feel free to contact us if you have any other inquies besides above.

Table 1 : Cathode active materials for Li-ion battery

Material	Structure	Voltage (V)	Discharge capacity (mAh/g)
$LiCoO_2$	Layered rocksalt	3.9	160
$LiNiO_2$	Layered rocksalt	3.8	200
$LiCo_{1/3}Ni_{1/3}Mn_{1/3}O_2$	Layered rocksalt	3.7	160
$LiMn_2O_4$	Spinel	4.0	100
$LiNi_{0.5}Mn_{1.5}O_4$	Spinel	4.5	135
$LiFePO_4$	Olivine	3.3	160

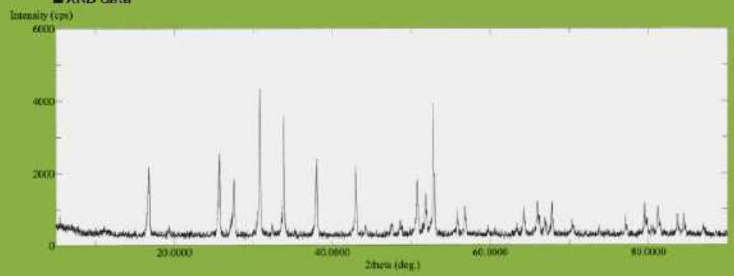
Table 2 : Ion conductivity of solid oxide electrolytes

Material	Conductivity@r.t. (S/cm)	Type
$Li_{0.34}La_{0.51}TiO_{2.94}$	1.4×10^{-3}	Perovskite
$Li_{1.3}Al_{0.3}Ti_{1.7}(PO_4)_3$	7×10^{-4}	NASICON
$Li_7La_3Zr_2O_{12}$	3×10^{-4}	Garnet
$50Li_4SiO_4\cdot50Li_3BO_3$	4.0×10^{-6}	Glass
$Li_{2.9}PO_{3.3}N_{0.46}$(LIPON)	3.3×10^{-6}	Amorphous film
$Li_{3.6}Si_{0.6}P_{0.4}O_4$	5.0×10^{-6}	Amorphous film
$Li_{1.07}Al_{0.69}Ti_{1.46}(PO_4)_3$	1.3×10^{-3}	Glass ceramics
$Li_{1.5}Al_{0.5}Ge_{1.5}(PO_4)_3$	4.0×10^{-4}	Glass ceramics

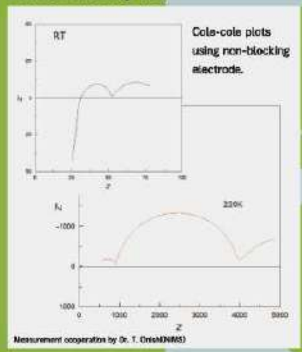
M. Tatsumisago and A. Hayashi, "Forefront of all solid state batteries", Gekkan Kagaku Vol.67 July, 2012.

$Li_{6.25}La_3Zr_2Ga_{0.25}O_{12}$ Substrate data

■XRD data



■ Ion conductivity data

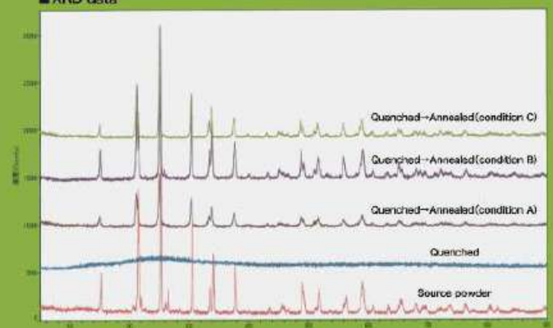


Size : □10mm×0.5t

Ion conductivity : 5.2×10^{-4}S/cm (r.t.) (Bulk ion conductivity 4.17×10^{-3}S/cm)

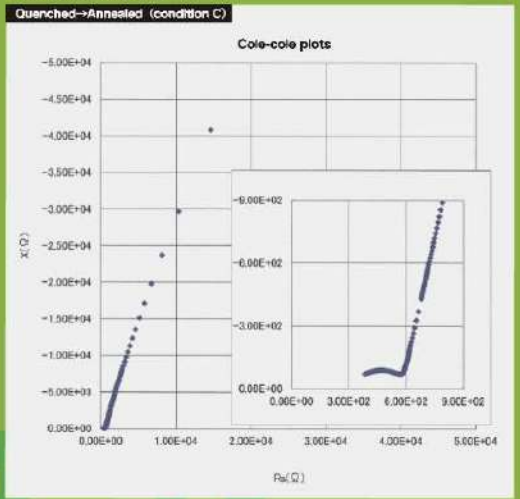
$Li_{1.5}Al_{0.5}Ge_{1.5}P_3O_{12}$ (Glass ceramics) Substrate data

■XRD data

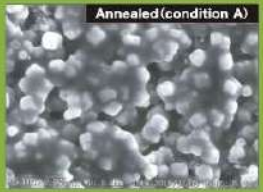


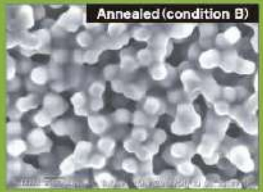
■ Ion conductivity data

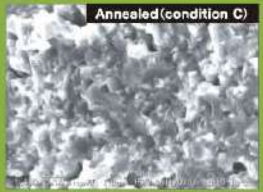
Quenched→Annealed (condition C)



■SEM images







Size : □10mmx0.75t

Ion conductivity : High frequency side 3.6×10^{-4}S/cm

Ion conductivity : Low frequency side 1.8×10^{-4}S/cm

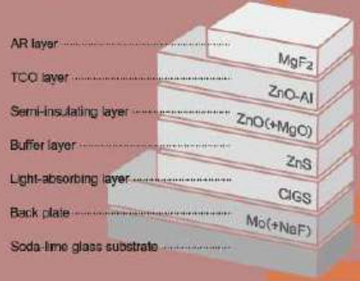
Solar cell materials

We provide a wide variety of materials for CIGS (Cu, In, Ga, Se multi-compound semiconductors) solar cell.

Light-absorbing layer	CuGa(Na)	CuInGa(Na)	Cu-Zn-Sn-S	$CuInTe_2$
Buffer layer	In_2S_3	ZnS	ZnOS	
Semi-insulating layer	ZnO	ZnO-MgO		
TCO layer	ZnO-Al_2O_3	ZnO-B_2O_3		
	ZnO-Ga_2O_3	TiO_2-Nb		
AR layer	MgF_2	Si_3N_4		
	TiO_2	Nb_2O_x		

Feel free to contact us if you have any other inquies besides above.

A model of CIGS solar cell



Fuel cell materials

Nowadays, proton conduction type of solid state oxide is developed for application of house, motorcar and cell phone, because it has high energy efficiency. Toshima is developing and synthesizing the solid state oxide materials by using some kinds of making process such as solid reaction, coprecipitation and sol-gel methods.

SOFC fuel cell

Cathode materials	$La_{1-x}Sr_xMnO_3$	$La_{1-x}Sr_xCoO_3$	$Sm_{1-x}Sr_xCoO_3$	
Electrolyte materials	$BaZrO_3$	$SrZrO_3$	$BaZr_{1-x}Y_xO_3$	$SrZr_{1-x}Y_xO_3$
	$BaCe_{1-x}Y_xO_3$	$SrCe_{1-x}Y_xO_3$		
Anode materials	NiO-$BaZrO_3$	NiO-$BaZr_{1-x}Y_xO_3$	NiO-$BaCe_{1-x}Y_xO_3$	
Catalyst materials	PtRu supporting C	Pt supporting $LiCoO_2$		
Hydrogen absorbing alloys	$LaNi_5$	Mg_2Ni		

Feel free to contact us if you have any other inquies besides above.

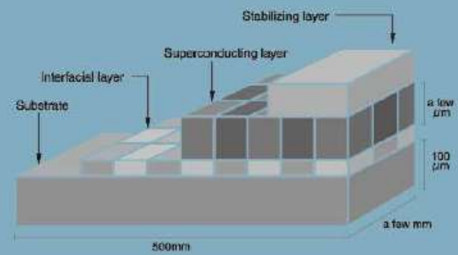
High-temperature superconducting materials

Superconductor technology enables to significant improvement of existing equipment as well as realization of innovative equipment in energy, electronics, and transportation fields. Especially high-temperature superconductors represented by yttrium and bismuth based oxides are developed among applied technologies. In recent years, superconductors are applied to wire rods by the progress of undercoat layers. Our deep experience for manufacturing of sputtering targets and PLD materials contributes to "dream technologies" supporting 21st century society.

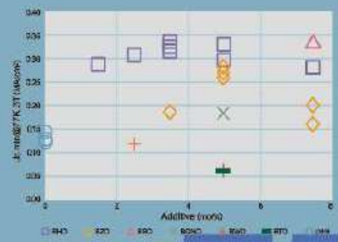
Superconducting materials	$YBa_2Cu_3O_x$	$GdBa_2Cu_3O_x$	$SmBa_2Cu_3O_x$	$Bi_2Sr_2CaCu_2O_x$	
	$(Bi_{2-x}, Pb_x)Sr_2Ca_2Cu_3O_x$				
Interfacial/buffer layer materials	CeO_2	$Gd_2Zr_2O_7$	Ce	Y	ZrO_2+Y_2O_3
Under layer materials	Ni-alloy	MgO	$SrTiO_3$	Al_2O_3	Mg

Feel free to contact us if you have any other inquies besides above.

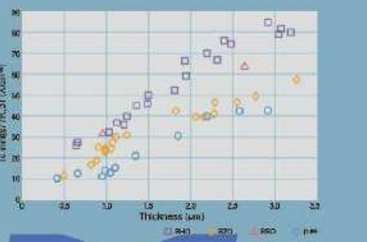
Structure of superconducting tape



Meissner effect



Additive dependance of Jc min at 77K and 1T for BMO doped GdBCO CCs, compared with pure GdBCO CCs.



Thickness dependance of Ic at 77K and 3T for BHO doped GdBCO CCs compared with BSO and BZO doped GdBCO CCs and pure GdBCO CCs.

Reference : H Tobita, K Notoh, ... Supercond. Sci. Technol. 25 (2012)

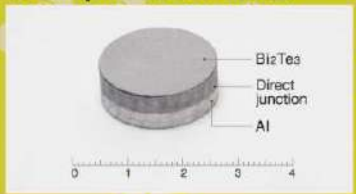
Thermoelectric conversion materials

Thermoelectric conversion attracts attention as energy harvest. On the basis of technical know-how of material developing, Toshima provides new thermoelectric conversion materials.

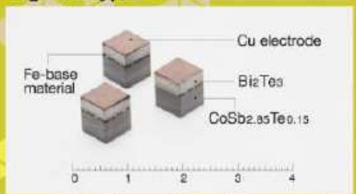
Metal type [N-type]	Bi_2Te_3	$CoSb_{2.85}Te_{0.15}$	Mg_2Si
Metal type [P-type]	$Bi_{0.3}Sb_{1.7}Te_3$	$CoSb_3$	$MnSi_{1.73}$
Oxide type	Na_xCoO_y	$Ca_3Co_4O_9$	$SrTiO_3$(with dopant)
Joint type	Bi_2Te_3 - Joint material - CoSbTe		
	BiSbTe - Joint material - $CoSb_3$		
	Electrode material - Bi-base material, Co-base material - Electrode material		
	Electrode material - Supplied material or trial piece - Electrode material		

Feel free to contact us if you have any other inquies besides above.

An example of Junction matrial

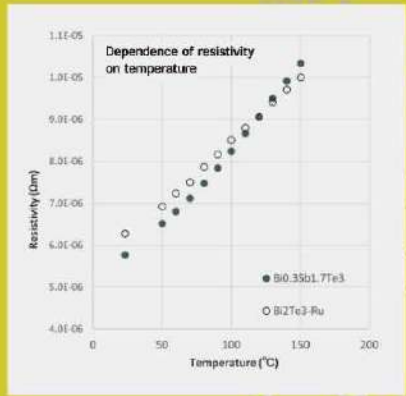


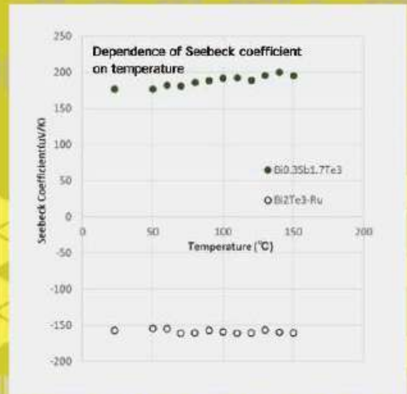
Segment type

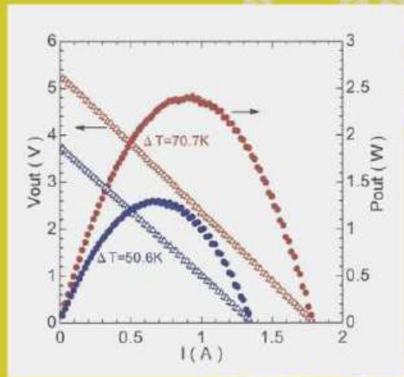


Bi_2Te_3 (N-type) & $Bi_{0.3}Sb_{1.7}Te_3$ (P-type)

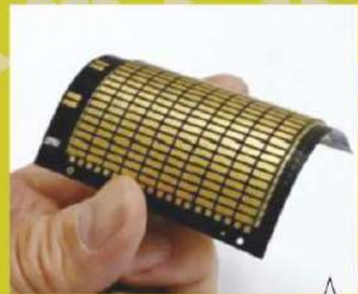
Evaluated chip : 3x20x1mm sampled from ϕ150mm wafer







Power generation characteristics of thermoelectric module
(Flexible module consisting of 260 pairs of P, N elements)



Picture of flexible thermoelectric module
(Provided from E-ThermoGentek Inc.)

Modularization

Process flow for Bi-Te system thermoelectric module

Our Process

Ingot production

Wafer processing

Electrode formation

Chip processing

We can supply various ingot, wafer (with/without electrode) and chip(with/without electrode).

Achievements of chip processing size:
0.3mm Cube ~ 2.0mm Cube

Artificial photosynthesis and Photocatalyst materials

Fuel cell vehicles were sold in the end of 2014. It is considered that hydrogen is one of the most important next generation energy as pollution free energy. In recent days, many institutes and governments develop artificial photosynthesis and photocatalyst materials and Toshima supplies various light absorbing materials to produce hydrogen or oxygen.

Photocatalyst materials of oxygen production/ hydrogen production

WO_3	Ta_3N_5	TaON	Bi_2MoO_6
$NaTaO_3$+La (~130nm)	Sn_3O_4 (~800nm)	$BaTaO_2N$	$SrTaO_2N$
$CaTaO_2N$	$BaNbO_2N$	$SrNbO_2N$	$CaNbO_2N$
$LaTiO_2N$	$LaTaON_2$	$LaNbON_2$	Ag-Cu-Ga-Sx
Ag-Cu-In-Sx	Sr-Ag-Sn-Sx		

Metal oxide precursor materials

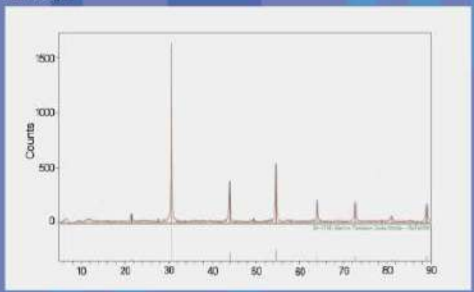
$Sr_2Ta_2O_7$	$Sr_2Nb_2O_7$	$LaTaO_4$	$LaNbO_4$	$La_2Ti_2O_7$
Ba-Ta-C-Ox	Ba-Nb-C-Ox	Ca-Ta-C-Ox	Ca-Nb-C-Ox	

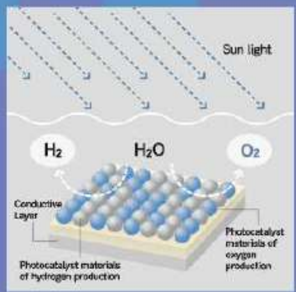
Co-catalyst / Supported catalyst materials

Pt	Rh	NiO	CoO	RuO_2

Feel free to contact us if you have any other inquies besides above.

$BaTaO_2N$





Ta_3N_5 TaON $BaTaO_2N$ $SrTaO_2N$ $CaTaO_2N$ $BaNbO_2N$ $SrNbO_2N$ $CaNbO_2N$ $LaTiO_2N$ $LaTaON_2$ $LaNbON_2$

Optical functional materials

Also, in addition to transparent electrodes, reflective films, AR coats (antireflective films), the application of light emitting elements such as LEDs and optoelectronics thin films has been expanding more and more. Toshima can respond widely and promptly to customer's requests from customized materials for research and development to mass production of AR coating material.

[N-type] Transparent oxide semiconductor materials	ZnO	SnO_2	In_2O_3	$InGaZnO_4$ (IGZO)	
	InZnSnOx (IZTO)	Zn_2SnO_4			
[P-type] Transparent oxide semiconductor materials	Cu_2O	NiO(+Li)	SnO	$CuAlO_2$	
	$CuCrO_2$	$SrCu_2O_2$	$ZnRh_2O_4$	$ZnIr_2O_4$	
Transparent conductive film materials	ITO	ZnO-Al_2O_3	ZnO-Ga_2O_3	SnO_2-Sb_2O_3	Ti-Nb-Ox
Heat ray reflective film materials	Ag-alloy	ITO	ZnO		
Anti-reflective film materials	MgF_2	Nb_2Ox	Al_2O_3	Ta_2O_5	TiO_2-SiO_2
Reflective film materials	Ag-alloy	Al-alloy			
LED materials	ITO	Ti-Nb-Ox	GaN	InN	SnO_2-Sb_2O_3 (ATO)
Optical media materials	CuSI	GeSbTe			

Feel free to contact us if you have any other inqeies besides above.

For various optical applications as touch panel, requests that optical mismatching with multilayer is solved are increasing. Toshima is developing and providing flexibility matching materials according to wavelength band.

	Materials	Properties	Refractive index at 550nm	Resistivity (Ω·cm)	Heat conductivity (W/m·K)	Thermal expansion coefficient (10^{-6}/K)	Flexural strength (MPa)
For Nb_2O_5 layer	Nb_2Ox	$Nb_{12}O_{29}$	2.35*	≦0.03	4.0	2.0	–
	Nb_2Ox-Al_2O_3	70:30 mol%	2.0*	≦0.5	–	–	–
For SiOx layer	Si-C*	69.7:30.3mol%	1.46～1.47*	≦0.02	110	2.9	240
	Si-Al*	95:5 wt%	1.48*	≦0.5	–	–	–
	Si(B dope)*	Crystalline	1.44*	≦0.02	–	–	77～85

* On O_2 reactive process

Piezoelectric ferroelectric materials

In the fields of FeRAM, various sensors, ink jet head and the like, ferroelectric thin films having excellent functions such as piezoelectric effect typified by PZT are widely applied. Toshima supplies high-density sputtering targets that maximize the characteristics of ferroelectrics. We also widely supply multiferroic materials and lead-free ferroelectric materials.

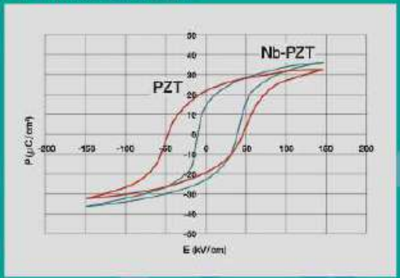
Piezoelectric & ferroelectric materials	$Pb(Zr,Ti)O_3$ (PZT)	$(Pb,La)(Zr,Ti)O_3$ (PLZT)	$Pb(Zr,Ti,Nb)O_3$ (PZTN)
	$SrBi_2Ta_2O_9$ (SBT)	$(K,Na)NbO_3$ (KNN)	$KNbO_3$
	$KTaO_3$	$(Na,Bi)TiO_3$ (NBT)	$BiFeO_3$ (BFO)
	$Pb(Mg, Nb)O_3$	$Pb(Yb, Nb)O_3$-$Pb(Zr)TiO_3$	$BiScO_3$-$Pb(Zr)TiO_3$

Gate insulator materials	HfO_2	HfSiO(N)	HfO_2-Al_2O_3	La_2O_3	La_2O_3-Al_2O_3

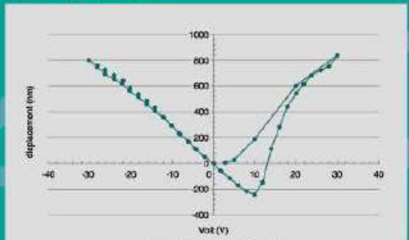
Electrode materials	Pt	Ir	IrO_2	$SrRuO_3$ (SRO)	$LaNiO_3$	TiN

Feel free to contact us if you have any other inquies besides above.

P-E Hysteresis loops



Butterfly curve



Butterfly curve of PZTN


PZTN


SRO High density

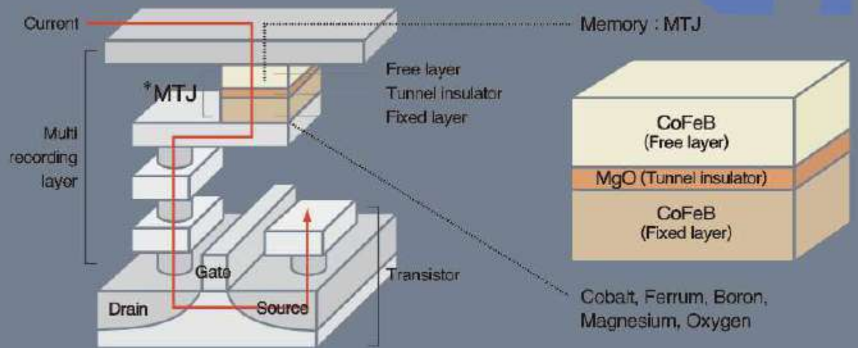

KNN

Magnetic RAM and device materials

We offer materials for the magnetic devices such as MRAM and MR device widely.

Magnetic RAM materials	CoMnSi	CoMnAl	CoMnSb	CoFeB	CoFeMnGe
	CoFeGaGe	FePt	IrMn	Ru	Ta
	Cu	Ni-Fe	MgO		

Feel free to contact us if you have any other inquies besides above.



*MTJ : Magnetic Tunnel Junction

Reference : Low-power Electrics Association & Project http://www.leap.or.jp/base3.html


Ru


Co-Mn-Ge

Sputter Coating Service

- We can consistently carry out in-house from target manufacturing to film deposition.
- Since all sputtering systems are of sputter-down type, it is possible to simultaneously form films on multiple substrates.
- We accept thin film deposition, such as evaluation before production, evaluation of new materials, and R&D, that meets customer's needs.
- Please contact us for exclusive reservations. We will conduct film deposition test thoroughly to realize the desired film quality.

Magnetron sputtering system L560

This is a sputtering system with a medium-sized chamber and we are constantly stocking over 200 kinds of cathode targets. We can respond quickly from cathode target completion to film formation test.

L560 appearance

Stage where three rows of 10mm square substrates are installed

Recommended use example	Film deposition test with different cathode target composition under fixed film deposition conditions
Film deposition example	Metal film : Al Pt Si Ti Zr Alloy film : Ag-C Ni-V Oxide film : Al_2O_3 CeO_2 Cr_2O_3 CuO Fe_2O_3 NiO SiO_2 SnO_2 TiO_2 ZnO Complex oxide film : $BaTiO_3$ IGZO ITO IZO Film for Li-ion battery : $LiCoO_2$ $LiMn_2O_4$ $LiNiO_2$ $LiNi_{1/3}Co_{1/3}Mn_{1/3}O_2$ $LiNi_{0.8}Co_{0.15}Al_{0.05}O_2$ $Li_4Ti_5O_{12}$ Nitride film : TiN Boride film : CrB_2 NbB_2 ZrB_2
Film thickness	Metal : ~1000nm、Oxide : ~500nm (Please contact us.)
Power supply	RF
Cathode size	ϕ3 inches
Gas	Ar, N_2, O_2
Distance between cathode target and stage	50mm
Stage heating	Impossible
Maximum number of substrate on stage	30mm square×14、50mm square×7, etc.
Reverse sputtering	Impossible

Magnetron sputtering system TM-3

This is a system capable of film deposition under various conditions such as reverse sputtering processing, stage heating, variable target - stage distance, and so on. Film deposition under conditions suitable with various targets are possible.

TM-3 appearance

Stage where two rows of 10mm square substrates are installed

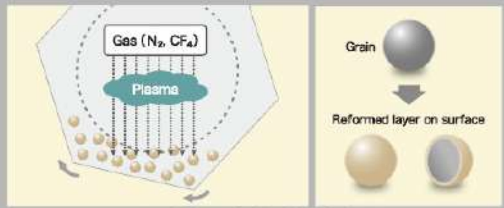
Au/Ni/thermoelectric material (3 layers)

Recommended use example	Film deposition test with fixed cathode target composition under various oxygen(nitrogen) concentration
Film deposition example	Metal film : Au Pt Ru Ti Ni C (Bi, Sb, Te: Stage cleaning fee separately) Oxide film : Al_2O_3 Ga_2O_3 NiO Complex oxide film : $BaTiO_3$ IGZO YSZ Film for Li-ion battery : $LiCoO_2$ $LiNi_{1/3}Co_{1/3}Mn_{1/3}O_2$ Li_3PO_4 $LiFePO_4$ $LiNbO_3$ Film for thermoelectric element : Bi_2Te_3-Ru Bi_2Te_3 $Bi_{0.3}Sb_{1.7}Te_3$ (Stage cleaning fee separately) Nitride film : GaN
Film thickness	Metal : ~1000nm、Oxide : ~500nm (Please contact us.)
Power supply	DC RF
Cathode size/installable Nr.	ϕ3 inches / 1~3 targets
Gas	Ar, N_2, O_2
Distance between cathode target and stage	50-90mm
Stage heating	600℃ maximum
Maximum number of substrate on stage	30mm square x 8, etc. (Please contact us in case of larger than 30mm square substrate.)
Reverse sputtering	Possible
Others	N_2 discharge available. Deposition pressure: 0.3~1Pa possible

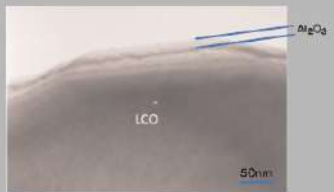
Powder coating service

We start powder coating service (sputtering and surface modification) thanks to joint research with Prof. Abe, Toyama Univ.

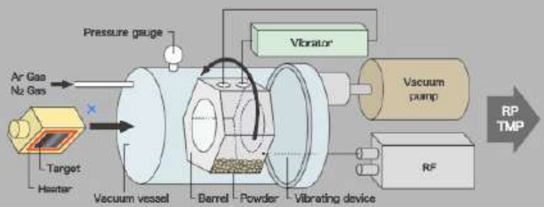
Barrel Sputtering Machine



Barrel Plasma Surface Modification



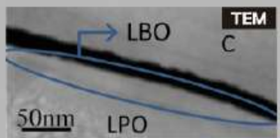
Coated 20nm Al2O3 on D50=3um LCO powder

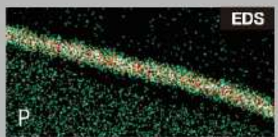


Coating and surface modification on powders by our cooperating companies

Li_3PO_4 deposited Li_3BO_3 powder

TEM-EDS image of 10~40nm Li_3BO_3 deposited 30μm Li_3PO_4 powder

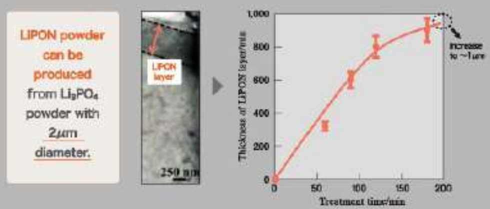




LiPON powder by nitridating the surface of Li_3PO_4

These samples are produced by nitridating the surface of Li_3PO_4 powder. 1μm nitride layer are generated by 180 minutes deposition.

■ Appearance dependence on deposition time



Analysis support

In addition, we possess various analytical instruments to provide high quality materials and develop advanced materials, and have analytical techniques advanced by many years material analysis.

Inquiry → Quotation → Sample acceptance → Pre-treatment → Observation & Measurement → Analysis → Report

Instrument	Type
ICP equipment	SEIKO Instruments Inc. SPS-3000

Instrument	Type
ICP equipment	Agilent Technologies 5110 ICP-OES

Instrument	Type
X-ray diffractometer (XRD)	Rigaku TTR Ⅱ

Instrument	Type
Laser diffraction particle size	NIKKISO Microtrac MT3000

Instrument	Type
Scanning electron microscope (SEM)	KEYENCE VE-7800

Instrument	Type
X-ray fluorescence spectrometer	SHIMADZU EDX-720

Instrument	Type
Thermogravimetry and Differential thermal analysis (TG-DTA)	Bruker 2020SA

Instrument	Type
Spectrophotometer	HITACHI U-1900

Joint development for new material research

Toshima supports new material development for whole thin film products such as powders, sputtering targets, MOCVD precursors and MOD solutions. In case you need us to contract Non-Disclosure Agreement for developing new materials, we will follow to your requirement without any problems.

2007
Development of corrosion resistant film on vacuum process

2008
Research for FRAM manufacturing technology, 1 other

2009
Development of oxide insulated covering technology, 2 others

2011
Development of Li-ion battery electrolyte material, 1 other

2012
Epitaxial mica forming by PLD method, 6 others

2013
Bi2Te3 device joint development, 5 others

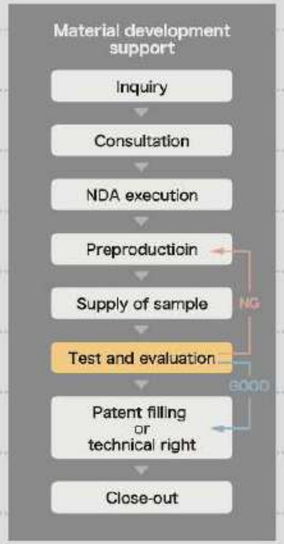
2014
Thin film Li-ion battery joint development, 1 other

2015
Sintered LLZ surface analysis, 5 others

2016
Ferroelectric material research on liquid phase, 8 others

2017
Synthesis and characterization of LiNbO3-LiCoO2 cathode for lithium ion battery with high rate capability, 8 others

2018
Characterization of LLZ type solid electrolyte sintered body, 10 others



Facilities

Toshima adopts continual production system with including raw material procurement, powder synthesis, sintering, machining, bonding etc.

▸▸▸ Calcination/Combustion

▸▸▸ Sintering

▸▸▸ Machining

Company Profile

Company Name	Toshima Manufacturing Co.,Ltd.	Capital	99 million JPY
Headquarter's location	1414 Shimonomoto, Higashimatsuyama, Saitama 355-0036, Japan Site area 24,968m² Building area 11,922m²	The number of employee	194 persons (Male : 155, Female : 39)
		President	Kentaro Kimoto
Division	[Parts Division] TEL : 0493-23-1213 URL : http://www.toshima-mfg.jp [Materials System Division] TEL : 0493-24-6774 URL : http://www.material-sys.com	Main business	[Parts Division] Cold-Forging + Pressing (Machining Cut + Assembly) [Materials System Division] Electronic material production
Subsidiary	TOSHIMA (THAILAND) CO., LTD.	Bank	Towa Bank Higashimatsuyama Branch Japan Finance Corporation Saitaman Branch Bank of Tokyo-Mitsubishi UFJ Kawagoe Branch
Establishment	1945/05/15		

History

1945 May
Ex-former President, Sokichi Kimoto established "Toshima Airplane Corporation" in Chihayacho, Toshima Ward, Tokyo. Started manufacturing loudspeaker's magnetic network parts (Loudspeaker's Yoke). Capital was $2,230

1949 October
Company name was changed as "Toshima Manufacturing Corporation"

1971 March
Established "Toshima Corporation" for manufacturing and selling its original products.

1971 December
Transferred headquater and a main factory to present location in Higashimatsuyama, Saitama.

1982 November
Former President Daisaku Kimoto inaugurated.

1993 April
Built new factory in Higashimatsuyama

1993 September
Materials system division is established

1994 September
Increased equipment for making sputtering targets

1998 May
Implemented sputtering machine

1999 April
Established MOCVD Gr.

2000 July
Obtained the ISO 9001 certification.

2001 December
Increased capital to $912,350.

2005 January
Increased capital to $1,193,202.

2005 October
KES STEP2 environmental management system was certificated.

2011 January
President Kentaro Kimoto and Chairman Daisaku Kimoto inaugurated.

2012 September
"TOSHIMA(THAILAND)CO., LTD." was established in Chonburi, Thailand.

2015 September
Obtained KES STEP2SR certification (EMS standard incorporating elements of Social Responsibility)

2017 July
Completed Advanced Material Center (AMC)

2018 March
Selected as Vibrant HABATAKU Small and Medium Enterprises by The Small and Medium Enterprise Agency, Ministry of Economy, Trade and Industry

2018 September
Obtained IATF16949:2016 certification (PT division)

Headquarter Toshima Manufacturing Co.,Ltd.

Advanced Material Center (AMC)

TOSHIMA (THAILAND) CO., LTD.