

# High Purity Materials for MBE Application



Vital Materials is a global rare metals oriented materials technology group. It is the leading vertically-integrated producer and developer of specialty materials, focusing on rare metals, advanced materials, and recycling services.

Vital supplies various types of high purity metals and compounds for MBE application, as well as many other advanced technologies, such as compound semiconductor doping, thermal vapor deposition, vacuum coating, MOCVD, etc.

## Analytical Capabilities

Vital Materials owns a wide Vital's laboratory was CNAS certificated since 2012, and it is the earliest CNAS (China National Accreditation Service for Conformity Assessment) lab in rare metal industry in China. Vital owns a wide range of physical and chemical analysis instrument, including:

### Chemical composition and trace element analysis:

GDMS, ICP-MS, ICP-OES, XRF, AAS, ETC.

### Physical properties:

XRD, DSC, LPS, SEM, microscope, etc.

### Metal-organic compound analysis:

FTIR, NMR, GC, LC, UV spectrophotometer, etc.

## Recycling Service

Vital Materials is dedicated to the development of tailor-made recycling technologies, allowing for the reuse of valuable metal elements by means of re-purification. We offer our customers recycling service, for Selenium, Tellurium, Indium, Gallium, Germanium, and precious metal containing materials.

## High Purity Metals/Compounds

Element	Products	Purity
Aluminum (Al)	Metals	High Purity Aluminum (Al)
		Ultra High Purity Aluminum (Al)
Boron (B)	Metals	High Purity Boron (B)
Beryllium (Be)	Metals	High Purity Beryllium (Be)
Antimony (Sb)	Metals	High Purity Antimony (Sb)
		Ultra High Purity Antimony (Sb)
	Compounds	Antimony Trichloride (SbCl <sub>3</sub> )
		Antimony Trioxide (Sb <sub>2</sub> O <sub>3</sub> )
		Cadmium Antimonide (Cd <sub>2</sub> Sb <sub>3</sub> )
		Tin Antimonide (SnSb)
Arsenic (As)	Metals	High Purity Arsenic (As)
		Ultra High Purity Arsenic (As)
	Compounds	Indium Arsenide (InAs)
		Cadmium Arsenide (CdAs)
		Zinc Arsenide (Zn <sub>3</sub> As <sub>2</sub> )
		Lead Arsenide (Pb <sub>3</sub> As <sub>2</sub> )
		Arsenic Sulfide (As <sub>2</sub> S <sub>3</sub> )
		Arsenic Trichloride (AsCl <sub>3</sub> )
Bismuth (Bi)	Metals	High Purity Bismuth (Bi)
	Compounds	Bismuth Oxide (Bi <sub>2</sub> O <sub>3</sub> )
		Bismuth Hydroxide (Bi(OH) <sub>3</sub> )
		Bismuth Trichloride (BiCl <sub>3</sub> )
Cadmium (Cd)	Metals	High Purity Cadmium (Cd)
Copper (Cu)	Metals	Ultra High Purity Cadmium (Cd)
Gallium (Ga)	Metals	High Purity Copper (Cu)
		High Purity Gallium (Ga)
	Compounds	Ultra High Purity Gallium (Ga)
		Gallium Trichloride (GaCl <sub>3</sub> )
Germanium (Ge)	Metals	Gallium Trioxide (Ga <sub>2</sub> O <sub>3</sub> )
		Ultra High Purity Germanium (Ge)
	Compounds	Zone Refined Ge (Ge)
		Germanium Tetrachloride (GeCl <sub>4</sub> )
		Fibre Optic Grade
		Ultra High Purity Fibre Optic

Element	Products	Purity	
Indium (In)	Metals	High Purity Indium (In)	5-6N
		Ultra High Purity Indium (In)	7-7.5N
	Compounds	Indium Hydroxide (In(OH) <sub>3</sub> )	5-6N
		Indium Oxide (In <sub>2</sub> O <sub>3</sub> )	5-6N
		Indium Nitrate, anhydrous (In(NO <sub>3</sub> ) <sub>3</sub> )	5-6N
		Indium Sulfate, anhydrous (In <sub>2</sub> (SO <sub>4</sub> ) <sub>3</sub> )	5-6N
Indium Trichloride, anhydrous (InCl <sub>3</sub> )	5-6N		
Lead (Pb)	Metals	High Purity Lead (Pb)	5-7N
Phosphorus (P)	Metals	High Purity Phosphorus (P)	6N
		Ultra High Purity Phosphorus (P)	7N
Sulfur (S)	Compounds	Gallium Phosphide (GaP)	6N
		High Purity Sulfur (S)	7N+
	Compounds	Arsenic Sulfide (As <sub>2</sub> S <sub>3</sub> )	6N
		Bismuth Sulfide (Bi <sub>2</sub> S <sub>3</sub> )	6N
		Germanium Sulfide (GeS)	6N
		Lead Sulfide (PbS)	6N
		Indium Sulfide (In <sub>2</sub> S <sub>3</sub> )	6N
		Zinc Sulfide (ZnS)	6N
		Antimony Sulfide (Sb <sub>2</sub> S <sub>3</sub> )	6N
		Cadmium Sulfide (CdS)	6N
Selenium (Se)	Compounds	High Purity Selenium (Se)	6N
		Zinc Selenide (ZnSe)	5-6N
	Compounds	Lead Selenide (PbSe)	5-6N
		Gallium Selenide (Ga <sub>2</sub> Se <sub>3</sub> )	5-6N
		Bismuth Selenide (Bi <sub>2</sub> Se <sub>3</sub> )	6N
		Tellurium Selenide (TeSe)	6N
		Indium Selenide (In <sub>2</sub> Se <sub>3</sub> )	6N
		Cadmium Selenide (CdSe)	6N
		Germanium Selenide (GeSe)	6N
		Antimony Selenide (Sb <sub>2</sub> Se <sub>3</sub> )	6N
Tin Selenide (SnSe <sub>2</sub> )	6N		
Tellurium (Te)	Compounds	High Purity Tellurium (Te)	6N
		Ultra High Purity Tellurium (Te)	7N
	Compounds	Cadmium Telluride (CdTe)	6N
		Zinc Telluride (ZnTe)	6N
		Bismuth Telluride (Bi <sub>2</sub> Te <sub>3</sub> )	6N
		Copper Telluride (CuTe)	5-6N
		Germanium Telluride (GeTe)	6N
		Lead Telluride (PbTe)	5-6N
		Tin Telluride (SnTe)	6N
		Gallium Telluride (Ga <sub>2</sub> Te <sub>3</sub> )	6N
		Indium Telluride (In <sub>2</sub> Te <sub>3</sub> )	6N
		Antimony Telluride (Sb <sub>2</sub> Te <sub>3</sub> )	5-6N
Telluride Dioxide (TeO <sub>2</sub> )	5-6N		
Tin (Sn)	Metals	High Purity Tin (Sn)	5-6N
Zinc (Zn)	Metals	High Purity Zinc (Zn)	5-6N
		Ultra High Purity Zinc (Zn)	7N

Other specifications are available upon request.

## Substrate Wafers

Product	Purity	Size
Gallium Arsenide (GaAs) Wafer	7N	2", 4", 6"
Indium Phosphide (InP) Wafer	6N	2", 3", 4"
Indium Antimonide (InSb) Wafer	6N	2", 3", 4"
Gallium Antimonide (GaSb) Wafer	6N	2", 3", 4"
Germanium (Ge) Wafer	6N	4", 6"

## Electronic Gases

Product	Purity	Package
Germane (GeH <sub>4</sub> )	6N+	20L/47.5L Aluminum Cylinder 440L Carbon Steel Cylinder
Hydrogen Selenide (H <sub>2</sub> Se)	6N+	47L Steel Cylinder
Arsine (AsH <sub>3</sub> )	6N+	47L Aluminum Cylinder
Phosphine (PH <sub>3</sub> )	6N+	47L Aluminum Cylinder

## MO Sources

Product	Purity	Package
Trimethyl gallium (TMGa) (Ga(CH <sub>3</sub> ) <sub>3</sub> )	6N	500g/1kg /4kg /7.2kg/ 14 kg/16kg Cylinder
Triethyl gallium (TEGa) (Ga(C <sub>2</sub> H <sub>5</sub> ) <sub>3</sub> )	6N	1kg/4kg Cylinder
Trimethylindium (TMIIn) (In(CH <sub>3</sub> ) <sub>3</sub> )	6N	350g/850g Cylinder
Trimethylaluminum (TMAI) (Al(CH <sub>3</sub> ) <sub>3</sub> )	6N	350g Cylinder

## Pyrolytic Boron Nitride (PBN)

Product	Purity	Size
PBN Tubes	5N	2", 4", 6"
PBN Plates	5N	2", 4", 6"
PBN Rods	5N	2", 4", 6"

Other specifications are available upon request.

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