

# GRIGNARD REAGENTS



Better chemistry – achieving more.

## GRIGNARD MANUFACTURING AT WEYL CHEM US INC.

### Adding Value with Grignard Reactions

One of the world's largest producers of custom chemicals, WeylChem offers the proper technical packages and production systems to reliably supply manufacturers with Grignard reagents and Grignard-derived intermediates anywhere in the world. What began in the 1970's as a strategy to produce flavorings synthetically using common Grignard reagents has expanded into industrial scale production for the manufacturing industries of the world.

Today we offer commercial Grignard reagents, uncommon Grignard reagents and Grignard-derived intermediates from pilot to industrial-scale. If you plan to reconfigure your plant for new projects, or adopt chemistries and processes that change the economics of your in-house Grignard manufacturing capability, consider the manufacturing assets, laboratory services and decades of expertise offered by WeylChem Group of Companies.

## Common and Uncommon Grignard Reagents

WeylChem's Grignard reagents have become a valuable tool for the formation of carbon-carbon bonds and for the formation of carbon-phosphorus, carbon-tin, carbon-silicon, carbon-boron and other carbon-heteroatom bonds.

## WEYL CHEM OFFERS A WIDE RANGE OF GRIGNARD REAGENTS:

Product	CAS	Formula
Allylmagnesium chloride	2622-05-1	C <sub>3</sub> H <sub>5</sub> ClMg
Benzylmagnesium chloride	6921-34-2	C <sub>7</sub> H <sub>7</sub> ClMg
Cyclohexylmagnesium chloride	931-51-1	C <sub>6</sub> H <sub>11</sub> ClMg
Ethylmagnesium bromide	925-90-6	C <sub>2</sub> H <sub>5</sub> BrMg
Ethylmagnesium chloride	2386-64-3	C <sub>2</sub> H <sub>5</sub> ClMg
Isobutylmagnesium bromide	926-62-5	C <sub>4</sub> H <sub>9</sub> BrMg
Isobutylmagnesium chloride	5674-02-2	C <sub>4</sub> H <sub>9</sub> ClMg
Isopropylmagnesium chloride	1068-55-9	C <sub>3</sub> H <sub>7</sub> ClMg
Vinylmagnesium chloride	3536-96-7	C <sub>2</sub> H <sub>3</sub> ClMg
Methylmagnesium chloride	676-58-4	CH <sub>3</sub> ClMg
n-Butylmagnesium chloride	693-04-9	C <sub>4</sub> H <sub>9</sub> ClMg
Phenylmagnesium chloride	100-59-4	C <sub>6</sub> H <sub>5</sub> ClMg
t-Butylmagnesium chloride	677-22-5	C <sub>4</sub> H <sub>9</sub> ClMg
4-Tolylmagnesium chloride	696-61-7	C <sub>7</sub> H <sub>7</sub> ClMg

## WeylChem Manufacturing Program Benefits

- 40 years of safe handling
- Industrial-scale capacity for commercial Grignard reagents
- Pilot plant to commercial 4,000 gallon scale
- Confidential handling of Grignard-derived intermediates
- Manufacturing services available on a commercial, custom or contract basis
- Multi-purpose, scalable facility for custom and specialty products
- In-house laboratory and technical services
- Robust packaging designed to handle hazardous chemistry

# CORE TECHNOLOGIES

## ● Downstream Chemistry

With multipurpose facilities, WeylChem is equipped to supply a wide range of multi-step chemicals that involve a Grignard reaction. Offering commercial Grignard reagent chemistry as well as downstream chemistry, WeylChem tailors manufacturing to deliver on the promise of higher performance and value.

## ● Material Handling

A multi-purpose production source, WeylChem supports customers with a full range of material handling capabilities.

## ● Organic chlorides:

Allyl Chloride, Allyl bromide, Allyl alcohol, Methyl Chloride, Benzyl Chloride, Benzoyl Chloride, Acetyl Chloride, Cyanuric Chloride

## ● Inorganic Chlorides:

Trichlorosilane, Phosphorous Oxychloride, Phosphorous Trichloride, Aluminum Chloride, Thionyl Chloride

## ● Gases and Reagents:

H<sub>2</sub>S, Ammonia, CO<sub>2</sub>, HCl, HBr, Bromine, Chlorine, Vinyl Chloride

## ● Solvents:

Dichlorobenzene, Methylene Chloride, Chloroform, Hexane, Toluene, MIBK, DMF, DMSO, THF, Diglyme, Methyl-THF, Monoglyme, Butyl Ether

## ● Others:

Sodium Nitrite, Phenol, Potassium Cyanide, Formaldehyde, Dimethylsulfate, Sodium Methoxide, Hydrogen Peroxide; Maleic Anhydride

# MANUFACTURING EQUIPMENT

A wide range of equipment is in place to produce Grignard reagents and Grignard-derived intermediates from pilot-scale to industrial-scale:

<b>Pilot Scale Equipment:</b>	100 gallons 650 gallons HF 600 Heinkel Hastelloy
<b>Large Scale Equipment:</b>	2,800 gallons 4,000 gallons
<b>Vessels/Reactors Equipment:</b>	67 stirred vessels/reactors (8-30 cm): 2000-8000 gallon SS & GL
<b>Solids Handling Equipment:</b>	3 Hastelloy Centrifuges for corrosive solids handling  2 Hastelloy dryers 1 tumble dryer
<b>Film Evaporators Equipment:</b>	6 Wiped-film evaporators (235°C; 1mmHg)
<b>Fractionating Units Equipment:</b>	12 fractionating units (170 - 235°C; 10-20 mmHg)
<b>Utilities</b>	Steam (170°C) Chiller (-40°C) Hot oil (265°C)

Let us help you create the Grignard chemistry solution you require.

Contact us for more information:

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