

Chemicals 4 Electronics

From advanced metal-organic chemistry to scalable semiconductor solutions

What C4E means for your business

Chemicals 4 Electronics covers the development and supply of high-purity metal-organic precursors for advanced chemical deposition and metallization processes such as ALD, CVD, PEALD, and Area-Selective Deposition (ASD) across the semiconductor value chain.

At the core of C4E is Umicore's ability to transform refined and recycled metals into production-ready fine chemicals – combining deep organometallic know-how with strict quality control, process consistency, and industrial relevance.

Your key benefits:

- Reliable access to high-performance metal-organic chemistry
- Materials designed for demanding semiconductor requirements
- Long-term availability supported by integrated metal sourcing
- A partner who understands both chemistry and semiconductor manufacturing

Reliable access to critical metals for semiconductor materials

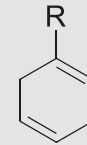
A periodic table of elements where several elements are highlighted in blue. These elements are Scandium (Sc), Yttrium (Y), Lanthanum (La), Zirconium (Zr), Niobium (Nb), Molybdenum (Mo), Technetium (Tc), Ruthenium (Ru), Rhodium (Rh), Palladium (Pd), Silver (Ag), Cadmium (Cd), Indium (In), Tin (Sn), Antimony (Sb), Tellurium (Te), Iodine (I), Xenon (Xe), Tantalum (Ta), Tungsten (W), Rhenium (Re), Osmium (Os), Iridium (Ir), Platinum (Pt), Gold (Au), Mercury (Hg), Thallium (Tl), Lead (Pb), Bismuth (Bi), Polonium (Po), Astatine (At), and Radon (Rn).

H																				He
Li	Be											B	C	N	O	F				Ne
Na	Mg											Al	Si	P	S	Cl				Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br				Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I				Xe
Cs	Ba	La-Lu	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At				Rn
Fr	Ra	Ac-Lr	Rf	Db	Sg	Bh	Hs	Mt	Ds	Rg	Cn	Nh	Fl	Mc	Lv	Ts				Og
		La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu				
		Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr				

Advanced metal-organic chemistry for modern deposition processes

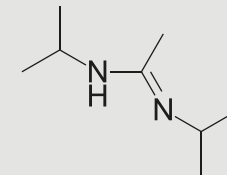
With decades of expertise in metal-organic chemistry, precursor design, industrial scaling, engineering, and the safe handling of highly sensitive materials, Umicore's team of metal-organic specialists delivers seamless scalability from lab-scale R&D quantities to high-volume manufacturing. This ensures a reliable technology transfer into production, as the company closely collaborates with research institutes, equipment manufacturers and Tier-1 integrators to transform complex materials challenges into production-ready solutions.

Tailored to your demand

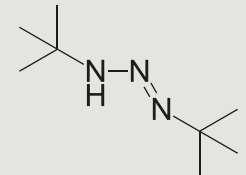


R = H, Me, Et

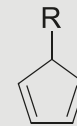
Cyclohexadienes



Amidines

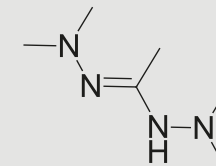


Triazenides

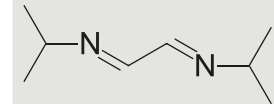


R = H, Me, Et, iPr

Cyclopentadienes

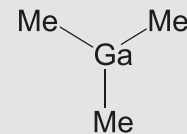


Aminoacetamidines

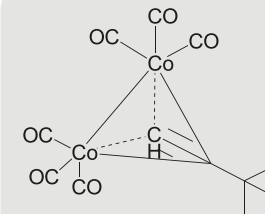


Diazadienes

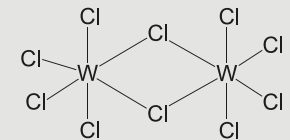
Broad scope of metal-organic and metal chemistry expertise



TMGa



CCTBA



Tungsten pentachloride

Ruthenium precursors for advanced electronics applications

High-purity ruthenium (Ru) precursors developed for demanding semiconductor deposition processes

Ruthenium plays an increasingly important role in advanced semiconductor architectures, particularly where low resistivity, excellent thermal stability, and compatibility with next-generation patterning concepts are required.

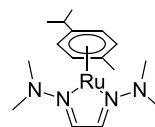
For you as a customer, this means:

- Superior electromigration robustness at nanoscale dimensions
- Barrier-less or reduced barrier integration capability
- Less resistivity penalty from surface and grain boundary scattering
- Excellent properties for use in advanced ALD processing
 - ✓ Short nucleation times on various substrates
 - ✓ High purity conformal films even at high aspect-ratio features
 - ✓ Fine thickness control at nanoscale levels
 - ✓ Stable interfaces due to conducting RuO₂

Looking ahead:

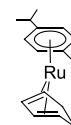
The current ruthenium portfolio represents the first step in Umicore PMC's broader Chemicals for Electronics offerings. Additional ruthenium precursors and further metal systems – including molybdenum-based precursors – are under development to support emerging semiconductor process requirements.

Ruthenium precursors product portfolio



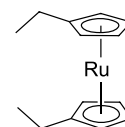
Trade name
Empirical formula
CAS no.

DeRu16
[(p-cymene)Ru(NMe₂DAD)]
2408521-59-3



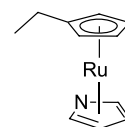
Trade name
Empirical formula
CAS no.

DeRu19
[(p-cymene)Ru(1,3-CHD)]
500591-28-6



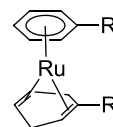
Trade name
Empirical formula
CAS no.

DeRu40
[Ru(EtCp)₂]
32992-96-4



Trade name
Empirical formula
CAS no.

DeRu42
[(pyr)Ru(EtCp)]
883284-96-6



Trade name
Empirical formula

DeRuXX
tailored to your needs

For inquiries and additional information please contact

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