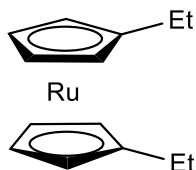


Catalog # 44-0040 Bis(ethylcyclopentadienyl)ruthenium(II), 98% (99.9%-Ru)



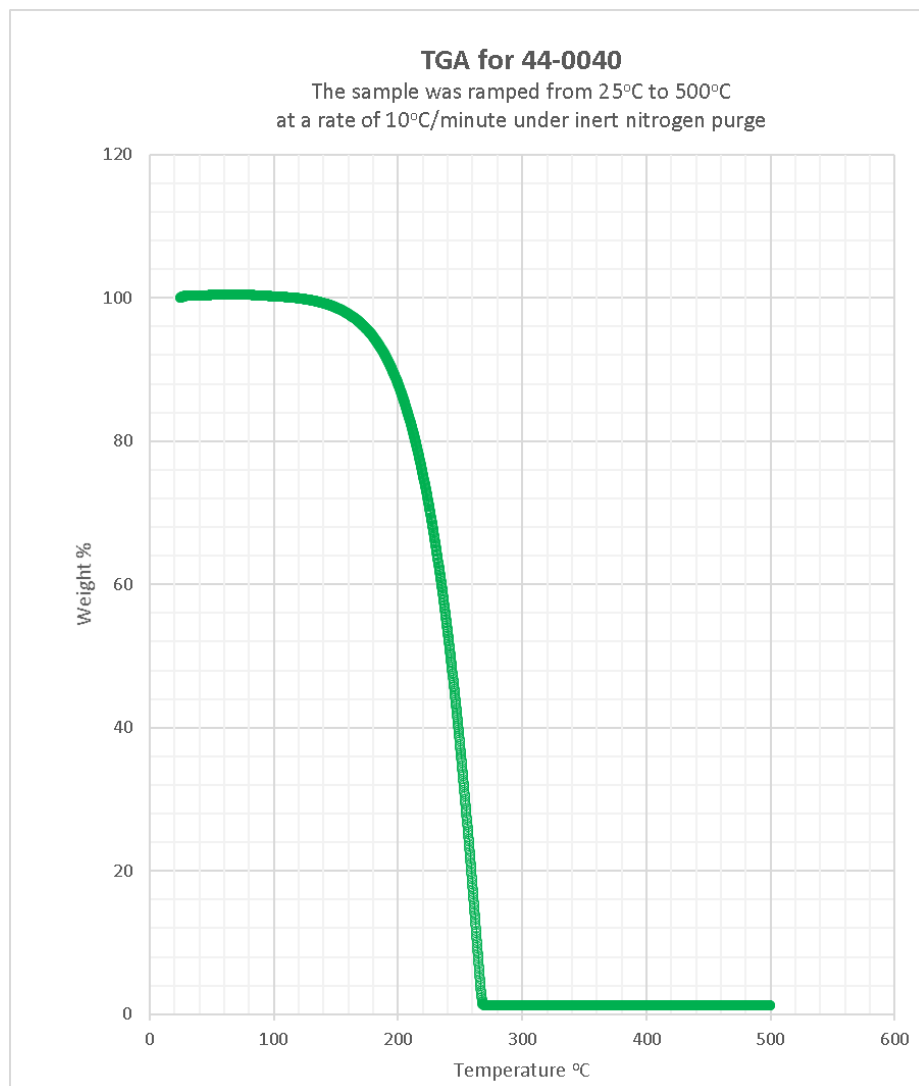
Thermal Behavior:

- Vapor pressure: 0.18 Torr at 80 °C [1]
- TGA available in [3]
- Melting point: 6 °C [7]
- Decomposition temperature: 350 °C [7]

Technical Notes:

1. Liquid Ru precursor with high thermal stability for ALD and CVD of ruthenium metal, oxide and tertiary nitride thin films.

Target Deposit	Deposition Technique	Delivery Temperature	Pressure	Co-reactants	Deposition Temperature	Ref.
Ru	ALD	80 °C	1-2 Torr	O ₂	270 °C	[5]
Ru	ALD	80 °C	1 Torr	O ₂ and H ₂	150-200 °C	[10]
Ru	CVD	115-120 °C	0.02-0.3 Torr	O ₂	300-500 °C	[2, 3]
Ru	PEALD	80 °C	3 Torr	NH ₃ plasma	270 °C	[1]
Ru	PEALD	50 °C	3.5 Torr	N ₂ /NH ₃ or N ₂ /H ₂ plasma	330 °C	[9]
RuO ₂	ALD	80 °C	3-5 Torr	O ₂	270 °C	[5]
RuO ₂	CVD	115 °C	0.3 Torr	O ₂	480 °C	[2]
RuTi _x N _y	PEALD	80 °C	3 Torr	Ti(NMe ₂) ₄ , N ₂ and H ₂ plasma	200 °C	[4]
RuTa _x N _y	PEALD	80 °C	3 Torr	Ta(NMe ₂) ₃ (NC ₅ H ₁₁), N ₂ and H ₂ plasma	230 °C	[6]
RuAl _x N _y	PEALD	80 °C	3 Torr	Me ₃ Al, NH ₃ plasma	300 °C	[8]



References:

1. [Electrochem. Solid-State Lett. **2004**, *7*, C46.](#)
2. [J. Mater. Res. **2004**, *19*, 2947.](#)
3. [Mater. Chem. Phys. **2005**, *93*, 142.](#)
4. [J. Electrochem. Soc. **2006**, *153*, G578.](#)
5. [J. Electrochem. Soc. **2007**, *154*, H773.](#)
6. [J. Electrochem. Soc. **2008**, *155*, H885.](#)
7. [Electrochem. Solid-State Lett. **2009**, *12*, D80.](#)
8. [Mater. Res. Bull. **2012**, *47*, 790.](#)
9. [ECS Solid State Lett. **2012**, *1*, P19.](#)
10. [Chem. Mater. **2015**, *27*, 4950.](#)