

Copernicium (Cn) - Student Datasheet

Element 112 · Superheavy synthetic element · source-reviewed learning reference

Copernicium is element 112, a synthetic superheavy Group 12 element named for Nicolaus Copernicus. Nuclear decay is measured, some atom-surface chemistry constrains reactivity, but its macroscopic state, density and phase boundaries remain experimentally unknown.

Quick reference

Atomic number	112
Relative atomic mass	[285]
Electron configuration	[Rn] 5f ¹⁴ 6d ¹⁰ 7s ²
Period / group / block	7 / 12 / d
Ordinary state	Macroscopic bulk state not experimentally established
Density	Unknown
Melting point	Unknown
Boiling point	Unknown
Oxidation states	Limited atom-scale chemistry; +2 often predicted
Electronegativity	Unknown

Structure & orbitals

Only tiny atom counts have been created. No bulk crystal model is shown because no macroscopic copernicium lattice has been experimentally established.

The 7s and representative 6d clouds are isolated-atom teaching approximations. They do not establish a measured liquid/solid state or a bulk metal band structure.

Phase behavior

No measured macroscopic copernicium phase boundaries are available. The phase explorer therefore shows an evidence-aware unknown bulk region rather than asserting a room-temperature liquid or an invented melting point.

Five things to remember

- Atomic number 112 means 112 protons.
- The reference configuration is [Rn] 5f¹⁴ 6d¹⁰ 7s².
- Copernicium is synthetic; only very small numbers of atoms have been produced.
- Macroscopic melting point, boiling point, density and crystal structure are unknown.
- Atom-surface chemistry gives some experimental information about volatility/reactivity without creating a bulk sample.

Copernicium: Real World & Signature Science

Big idea

The question “is copernicium a liquid?” does not have a measured bulk answer. Some theoretical treatments discuss unusual volatility or weak metallic bonding, but ElementLookup keeps prediction separate from observation.

Why this element is scientifically distinctive

Inspect a ^{285}Cn teaching nucleus and 7s/6d probability models, then use Evidence Lens to separate decay-chain evidence and atom-surface experiments from predicted chemistry and unknown bulk phase, density and structure.

Discovery at GSI	Element 112 was first produced at GSI in Darmstadt, Germany, in 1996 and later recognized by IUPAC.
Copernicus name	The element was named copernicium after astronomer Nicolaus Copernicus; symbol Cn was adopted.
Atom-surface chemistry	A few-atom experiments can probe adsorption/volatility behavior even when no bulk sample exists.
Relativistic effects	Very high nuclear charge strongly affects 7s/6d electron energies and challenges simple Group 12 extrapolation.
Unknown bulk state	Statements that Cn is definitively a liquid, solid, or gas at room temperature exceed measured macroscopic evidence.

How copernicium evidence is built: nuclei, atoms and theory

1. Superheavy experiments create very few copernicium atoms in accelerator research; operational synthesis parameters are outside this page.
2. Decay chains establish isotope identity and nuclear properties.
3. Specialized atom-surface experiments can constrain volatility/chemical interaction one atom at a time.
4. Relativistic theory predicts properties that cannot yet be measured in bulk; those predictions remain explicitly labelled.

History checkpoints

1996	GSI scientists in Darmstadt announced production of element 112.
2009	IUPAC recognized the GSI team's discovery claim.
2010	The name copernicium and symbol Cn were formally approved.
Today	Research focuses on nuclear decay, atom-scale chemistry and relativistic theory.

Copernicium: Isotopes, Questions & Evidence

Isotope context

²⁸⁵ Cn	Radioactive superheavy isotope	Reference teaching nucleus with 112 protons and 173 neutrons.
²⁸³ Cn	Radioactive isotope	Observed in superheavy decay chains and atom-scale chemistry experiments.
Copernicium isotope context	No stable isotopes	All known isotopes are short-lived research nuclides.

Common questions

What is copernicium's atomic number?

112.

Is copernicium a transition metal?

It is placed in Group 12/d-block, but superheavy relativistic effects make simple "ordinary transition metal" descriptions incomplete.

Is copernicium a liquid at room temperature?

No macroscopic room-temperature phase has been experimentally established. Treat definitive liquid/solid claims as predictions unless evidence is specified.

What is copernicium used for?

Fundamental research only.

Quick self-check

Q: What is copernicium's atomic number? | Answer: 112. Atomic number equals proton count.

Q: Where was it first produced? | Answer: GSI Darmstadt. GSI announced element 112 in 1996.

Q: Is the room-temperature bulk state measured? | Answer: No. No macroscopic sample has established the bulk state.

Evidence & safety

Nuclear identity/decay are measured; atom-surface chemistry offers limited experimental chemical evidence; macroscopic density, phase boundaries, appearance and crystal structure remain unknown. Theory is labelled predicted.

Copernicium exists only in specialist accelerator research. This page contains no synthesis parameters, accelerator settings or operational nuclear-material instructions.

Core sources

Royal Society of Chemistry - Copernicium

<https://periodic-table.rsc.org/element/112/copernicium>

IUPAC - Copernicium naming recommendation

<https://iupac.org/what-we-do/periodic-table-of-elements/>

GSI - Discovery of element 112

https://www.gsi.de/work/forschung/nustarennanustarennadivisions/she_physik/research/super_heavy_elements.htm