

Seaborgium (Sg) - Student Datasheet

Element 106 · Synthetic superheavy Group 6 element · source-reviewed learning reference

Seaborgium is element 106, a synthetic superheavy Group 6 element. Its nuclei and decay are measured, and atom-at-a-time chemistry has shown behavior comparable with molybdenum and tungsten, but no bulk color, density, phase boundary or crystal lattice has been measured.

Quick reference

Atomic number	106
Relative atomic mass	[269]
Electron configuration	[Rn] 5f ¹⁴ 6d ⁴ 7s ²
Period / group / block	7 / 6 / d
State context	Macroscopic bulk state not experimentally established
Density	Unknown
Melting / transition	Unknown
Boiling / gas reference	Unknown
Oxidation states	Atom-scale Group 6 chemistry; +6 behavior experimentally probed
Electronegativity	Unknown

Structure & orbitals

No macroscopic seaborgium crystal has been measured. The viewer stays as an evidence panel rather than assigning a BCC lattice from tungsten or molybdenum.

Representative 6d/7s probability shapes are theory-led isolated-atom teaching forms, not measured orbitals in a bulk solid.

Phase behavior

No measured macroscopic seaborgium phase boundaries exist. The temperature explorer remains explicitly unknown and does not promote theoretical phase estimates to measured facts.

Five things to remember

- Atomic number 106 means 106 protons.
- Seaborgium is synthetic and all known isotopes are radioactive.
- Atom-scale chemistry has experimentally tested Group 6-like behavior.
- Bulk appearance, density, melting/boiling points and crystal structure are unknown.
- The element is named for chemist Glenn T. Seaborg.

Seaborgium: Real World & Signature Science

Element-specific science, uses and history

Big idea

Periodic placement below tungsten is useful for designing experiments, not for inventing a “tungsten-like chunk” of seaborgium. Experiments on only a few atoms can establish meaningful chemistry while leaving macroscopic material properties unknown.

Why this element is scientifically distinctive

Explore Sg across the teaching nucleus, isolated-atom orbitals, evidence-aware material structure and temperature/evidence views, then connect those models to uses, isotopes and source-backed context.

Nuclear identity	Seaborgium is identified from atom-by-atom synthesis and radioactive decay.
Atom-scale chemistry	Experiments with very few atoms have tested volatile/solution chemistry comparable with lighter Group 6 homologues.
Discovery history	Berkeley and Dubna work shaped discovery and naming discussions for element 106.
Naming	Seaborgium was named for Glenn T. Seaborg, unusually while he was still alive.
Unknown bulk world	No practical-use or bulk-material claims are made because macroscopic Sg does not exist.

How seaborgium knowledge is built: measured atoms, cautious extrapolation

1. Specialized accelerator experiments create only tiny numbers of atoms; operational synthesis parameters are outside this guide.
2. Decay measurements establish isotope identity and nuclear properties.
3. Rapid single-atom chemistry tests Group 6 behavior before the atoms decay.
4. Theory helps interpret relativistic effects, while all macroscopic properties remain explicitly unknown.

History checkpoints

1970s	Berkeley and Dubna groups reported work related to element 106.
1990s	Naming element 106 after Glenn Seaborg became part of the transfermium naming debate.
1997	IUPAC adopted seaborgium (Sg) in the final naming resolution.
1997 and after	Atom-scale chemical experiments demonstrated meaningful Group 6 comparisons with molybdenum and tungsten.

Seaborgium: Isotopes, Questions & Evidence

Evidence status and learner self-check

Isotope context

²⁷¹ Sg	Radioactive superheavy isotope	Reference teaching nucleus with 106 protons and 165 neutrons.
Other Sg isotopes	Radioactive	Several synthetic isotopes are known through decay-chain research.
Seaborgium isotope context	No stable isotopes	All known seaborgium isotopes are synthetic and radioactive.

Common questions

What is seaborgium?

Seaborgium is synthetic element 106, placed in Group 6.

Is seaborgium a metal?

It is classified as a Group 6 transition element and expected to be metallic, but no macroscopic metal sample has been measured.

What is seaborgium used for?

Fundamental nuclear and atom-scale chemical research only.

What does seaborgium look like?

No macroscopic appearance has been experimentally observed, so a definite color should not be presented as fact.

Quick self-check

Q: What is seaborgium's atomic number? | Answer: 106. Atomic number equals proton count.

Q: What can atom-scale experiments test? | Answer: Group 6 chemical behavior. Very small atom counts can still yield chemical evidence.

Q: What is its measured crystal structure? | Answer: Unknown. No macroscopic crystal exists.

Evidence & safety

Nuclear production/decay are experimental and atom-scale Group 6 chemistry has experimental support. Bulk state, density, melting/boiling points, appearance and crystal structure remain unknown.

Seaborgium exists only in specialized superheavy-element research. No accelerator settings, target preparation, synthesis, separation or handling procedures are provided.

Core sources

Royal Society of Chemistry - Seaborgium

<https://periodic-table.rsc.org/element/106/seaborgium>

IUPAC - Periodic Table / naming resources

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