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# (U) Ununpentium

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From Intellipedia

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**Ununpentium** is the temporary name of a synthetic superheavy element in the periodic table that has the temporary symbol **Uup** and has the atomic number 115. Multiple isotopes have been made by a fusion of calcium and americium (Uup-288 with the most neutrons). It can be referred to as **eka-bismuth**.

Element 115 also falls in the center of the theoretical island of stability. Although no stable isotopes have yet been found, conventional models predict that if stable isotopes of element 115 can be produced, they will most likely need the "magic number" of 184 neutrons, which would be Uup-299. The currently fabricated isotopes only had at most 173 neutrons (Uup-288).

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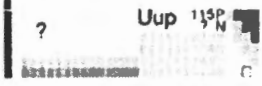
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## History

On 2 February 2004, synthesis of ununpentium and ununtrium were reported in Physical Review C by a team composed of Russian scientists at Dubna University's Joint Institute for Nuclear Research and American scientists at the Lawrence Livermore National Laboratory.<sup>[1][2]</sup>

The team reported that they bombarded americium (element 95) with calcium (element 20) to produce four atoms of ununpentium (element 115). These atoms, they report, alpha decayed to ununtrium (element 113) in approximately 100 milliseconds. The ununtrium produced then existed for 1.2 seconds before decaying into natural elements.

The synthesizing of the element was also reported by scientists of Japan.

Ununpentium		
		
General		
Name	Symbol	Series
ununpentium	Uup	
Group	Period	Block
Physical Properties		
Atomic Number	Atomic Mass	Atomic Radius
115	(299) g·mol <sup>-1</sup>	pm
Appearance		
Covalent Radius	Phase	Density
pm		g·cm <sup>-3</sup>
Configuration		
Crystal Structure	Electron Configuration	Electrons per Shell
	[Rn] 5f14 6d10 7s2 7p3 (guess based on bismuth)	2, 8, 18, 32, 32, 18, 5
Other Information		
Oxidation States	Ionization Energy	CAS Registry Number
	(est.)	54085-64-2

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In May 2006 in the Joint Institute for Nuclear Research the synthesis of this element was confirmed by another method (the chemical identifying on final products of decay of element).

Ununpentium is a temporary IUPAC systematic element name. Element 115 is also sometimes called *eka-bismuth*.

## Chemical Properties

For now element 115 has only been manufactured in the amount of a few atoms, so the chemistry of element 115 has yet to be researched, but chemistry and physics can tell us a lot about what to expect. Although element 115 is in the same group as bismuth, its chemistry will probably be strongly altered by relativistic effects.<sup>[3]</sup> One important predicted difference from bismuth is the presence of a stable oxidation state of +1, and a  $\text{Uup}^+$  ion with a chemistry similar to  $\text{Tl}^+$ . There has been some experimental data for other superheavy elements, such as element 112, which seems to confirm relativistic effects for superheavy elements.

## Isotopes

Ununpentium has no stable isotopes. A standard atomic mass cannot be given.

Nuclide Symbol	Z(p)	N(n)	Isotopic Mass (u) <sup>[4]</sup>	Half-Life <sup>[5]</sup>	Nuclear Spin <sup>[5]</sup>
			Excitation Energy		
<sup>287</sup> Uup	115	172	287.19119(85) <sup>[6]</sup>	32(+155-14) ms	
<sup>288</sup> Uup	115	173	288.19249(92) <sup>[6]</sup>	87(+105-30) ms	
<sup>289</sup> Uup	115	174	289.19272(110) <sup>[6]</sup>	10 s <sup>[6]</sup>	
<sup>290</sup> Uup	115	175	290.19414(106) <sup>[6]</sup>	10 s <sup>[6]</sup>	
<sup>291</sup> Uup	115	176	291.19438(95) <sup>[6]</sup>	1 min <sup>[6]</sup>	

## In Popular Culture

Ununpentium has been theorized to be inside the island of stability. This probably explains why it was mentioned regularly in popular culture, especially in UFO conspiracy theories. The most popular account of element 115, from Bob Lazar, is considered pseudoscience.<sup>[7]</sup> Although it is reasonable to suppose that element 115 will have unique properties, there is no openly available empirical evidence to back up Lazar's claims.

## References

- ↑ Oganessian, Yuri. et al. "Experiments on the Synthesis of Element 115 in the Reaction  $^{243}\text{Am} (^{48}\text{Ca},\text{xn})^{291-x}\text{115}$ ." *Physical Review C*, Volume 69 (2004), page 021601.
- ↑ Oganessian, Yuri. et al. "of Elements 115 and 113 in the Reaction  $^{243}\text{Am} + ^{48}\text{Ca}$ ." *Physical Review C*, Volume 72 (2005) page 034611.

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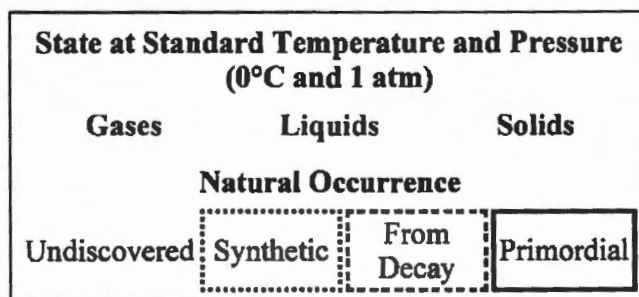
3. ↑ Keller, O. L.; Nestor, C. W. Fricke, Burkhard. "Predicted Properties of the Superheavy Elements III: Element 115, Eka-bismuth." *Journal of Physical Chemistry*, Volume 78 (1974) pages 1945-1949.
4. ↑ Audi, G.; Wapstra, A.H.; Thibault, C.; Blachot, J.; Bersillon, O. "Ame2003 Atomic Mass Evaluation." *Nuclear Physics*, A729 (2003).
5. ↑ <sup>5.0 5.1</sup> Audi; Bersillon; Blachot; Wapstra. "The Nubase2003 Evaluation of Nuclear and Decay Properties." *Nuclear Physics*, A 729, pages 3-128 (2003); National Nuclear Data Center, Brookhaven National Laboratory. Information extracted from the NuDat 2.1 database Retrieved September 2005.; Lide, David R. (editor); Holden, Norman E. "Section 11, Table of the Isotopes." *CRC Handbook of Chemistry and Physics* 85th Edition. Boca Raton: CRC Press, 2005.
6. ↑ <sup>6.0 6.1 6.2 6.3 6.4 6.5 6.6 6.7</sup> Values are not purely derived from experimental data, but at least partly from systematic trends. Spins with weak assignment arguments are enclosed in parentheses.
7. ↑ Morgan, David L. "Lazar Critique," 26 August 1996 (revised October 2005).

## External Links

- Apidium. "Ununpentium."
- Glanz, James. "Uut and Uup Add Their Atomic Mass to Periodic Table." *New York Times*, 1 February 2004.
- Oganessian, Yuri. "Superheavy Elements: The Recent Discovery of Elements 113 and 115 Will Tell Us More About the Structure of the Nucleus and the Possible Existence of the *Island of Stability*." Physicsweb.org, July 2004.
- van der Krogt, Peter. "115 Ununpentium." *Elementymology & Elements Multidict*, 8 January 2006.
- WebElements.com. "Ununpentium."

## Element Series

72	73	74	75	76	77	78	79	80	81	82	83	84	85	86
104	105	106	107	108	109	110	111	112	113	114	115	116	117	118
Rf	Db	Sg	Bh	Hs	Mt	Ds	Rg	Uub	Uut	Uuq	Uup	Uuh	Uus	Uuo



Retrieved from [redacted]

Categories: Transactinides | Chemical Elements

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4/13/2017



NATIONAL SECURITY AGENCY  
FORT GEORGE G. MEADE, MARYLAND 20755-6000

FOIA Case: 101326A  
24 September 2018

JOHN GREENEWALD  
27305 W LIVE OAK ROAD  
SUITE 1203  
CASTAIC CA 91384

Dear Mr. Greenewald:

This responds to your Freedom of Information Act (FOIA) request of 11 April 2017, which was received by this office on 12 April 2017 for Intellipedia records on Unidentified Flying Object, Unidentified Flying Objects, UFO, UFOs, Flying Saucer, Flying Saucers, Project Sign, Project Grudge, and Project Saucer. As stated in our initial response to you, dated 12 April 2017, your request was assigned Case Number 101326. For purposes of this request and based on the information you provided in your letter, you are considered an "all other" requester. As such, you are allowed 2 hours of search time and the duplication of 100 pages at no cost. There are no assessable fees for this request. Your request has been processed under the provisions of the FOIA.

For your information, NSA provides a service of common concern for the Intelligence Community (IC) by serving as the executive agent for Intelink. As such, NSA provides technical services that enable users to access and share information with peers and stakeholders across the IC and DoD. Intellipedia pages are living documents that may be originated by any user organization, and any user organization may contribute to or edit pages after their origination. Intellipedia pages should not be considered the final, coordinated position of the IC on any particular subject. The views and opinions of authors do not necessarily state or reflect those of the U.S. Government.

We conducted a search across all three levels of Intellipedia and located documents responsive to your request. The documents are enclosed. Certain information, however, has been deleted from the documents. One responsive document has already been provided to you in case 103173, closed on 14 September 2018.

This Agency is authorized by statute to protect certain information concerning its activities (in this case, internal URLs), as well as the names of its employees. Such information is exempt from disclosure pursuant to the third exemption of the FOIA, which provides for the withholding of information

specifically protected from disclosure by statute. The specific statute applicable in this case is Section 6, Public Law 86-36 (50 U.S. Code 3605). We have determined that such information exists in this record, and we have excised it accordingly.

In addition, personal information regarding individuals has been deleted from the enclosure in accordance with 5 U.S.C. 552 (b)(6). This exemption protects from disclosure information that would constitute a clearly unwarranted invasion of personal privacy. In balancing the public interest for the information you requested against the privacy interests involved, we have determined that the privacy interests sufficiently satisfy the requirements for the application of the (b)(6) exemption.

Since these deletions may be construed as a partial denial of your request, you are hereby advised of this Agency's appeal procedures. If you decide to appeal, you should do so in the manner outlined below.

- The appeal must be in sent via U.S. postal mail, fax, or electronic delivery (e-mail) and addressed to:

NSA FOIA/PA Appeal Authority (P132)  
National Security Agency  
9800 Savage Road STE 6932  
Fort George G. Meade, MD 20755-6932

The facsimile number is (443)479-3612.

The appropriate email address to submit an appeal is [FOIARSC@nsa.gov](mailto:FOIARSC@nsa.gov).

- It must be postmarked or delivered electronically no later than 90 calendar days from the date of this letter. Decisions appealed after 90 days will not be addressed.
- Please include the case number provided above.
- Please describe with sufficient detail why you believe the denial was unwarranted.
- NSA will endeavor to respond within 20 working days of receiving your appeal, absent any unusual circumstances.

For further assistance or to discuss your request, you may contact our FOIA Public Liaison at [foialo@nsa.gov](mailto:foialo@nsa.gov). You may also contact the Office of Government Information Services (OGIS) at the National Archives and Records Administration to inquire about the FOIA mediation services they offer: Office of Information Services, National Archives and Records Administration, 8601 Adelphi Road-OGIS, College Park, MD 20740-6001; e-mail: [ogis@nara.gov](mailto:ogis@nara.gov); main: 202-741-5770; toll free: 1-877-684-6448; or fax: 202-741-5769.

Some responsive material contains the equities of another government agency. Because we are unable to make determinations as to the releasability of another agency's information, the subject material has been referred to the appropriate agency for review and direct response to you.

Sincerely,

*Paul H*  
*for*

John R. Chapman  
Chief, FOIA/PA Office  
NSA Initial Denial Authority

Encls:  
a/s