此處以發現年份順序列出已知各元素。其發現年份基本上定義為首次確認為純元素的年份，而許多元素均沒有準確的發現日期。並沒有文獻記錄遠古時期幾種元素的發現。

[[Image:Periodic table.svg|right|200px|thumb|[[化學元素周期表]]]]

==未被記錄的發現==

{| class="wikitable sortable"

|-

! [[原子序]]<br>

! 名稱<br>

! 最早用途<br>

! 最早樣本

! 發現者

! 發現地

! class="unsortable" |備註

|-

|29

|[[銅]]

|前9000

|前6000

|[[中東]]

|[[阿納托利亞]]

|銅可能是最早被人類開採及雕刻工藝的金屬。<ref>{{cite web|url=http://www.rameria.com/inglese/history.html |title=Copper History |publisher=Rameria.com |date= |accessdate=2008-09-12}}</ref>估計最早於約公元前9000年在中東發現。它是在人類[[紅銅時代]]及[[青銅時代]]其中一種最重要的物質。公元前6000年的銅粒在[[阿納托利亞]]出土。<ref>[http://www.csa.com/discoveryguides/copper/overview.php CSA - Discovery Guides, A Brief History of Copper]</ref>

|-

|79

|[[金]]

|前6000前

|前5500

|[[中東]]

|[[埃及]]

|考古學家提出中東最早一批文明就已開始使用金。金可能是人類最早使用的金屬。現存最早的黃金首飾是發現於埃及Zer皇后的陵墓中。<ref>{{cite web|url=http://bullion.nwtmint.com/gold\_history.php |title=Gold History |publisher=Bullion.nwtmint.com |date= |accessdate=2008-09-12}}</ref><ref>{{cite web|url=http://indianvillage.com/turquoiseinfo.htm |title=The Turquoise Story |publisher=Indianvillage.com |date= |accessdate=2008-09-12}}</ref>

|-

|82

|[[鉛]]

|前7000

|前3800

|[[近東]]

|[[埃及]]

|相信至少9000年前便出現鉛的煉製，而現今最早的鉛製工藝品是發現於埃及[[阿拜多斯]]的[[歐西里斯]]神殿裏的一個小雕像，於公元前3800製。<ref>{{cite web|url=http://www.lead.org.au/lanv2n3/lanv2n3-22.html |title=The History of Lead - Part 3 |publisher=Lead.org.au |date= |accessdate=2008-09-12}}</ref>

|-

|47

|[[銀]]

|前5000前

|約前4000

|?

|[[小亞細亞]]

|估計稍遲於銅和金的發現。<ref>[http://elements.vanderkrogt.net/elem/ag.html 47 Silver]</ref><ref>{{cite web|url=http://chemistry.about.com/od/elementfacts/a/silver.htm |title=Silver Facts - Periodic Table of the Elements |publisher=Chemistry.about.com |date= |accessdate=2008-09-12}}</ref>

|-

|26

|[[鐵]]

|前5000前

|前

|?

|[[埃及]]

|有證據顯示鐵在公元前5000之前就已被發現。<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/fe.html |title=26 Iron |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>已知的最早鐵製物為在埃及發現的，約於公元前4000年由隕石上的鐵製造的幾顆小珠。鐵的煉製大約在公元前3000年開始，人們開始用鐵製造工具和武器，標誌著公元前1200年[[鐵器時代]]的開始。<ref>{{cite web|url=http://courses.wcupa.edu/jones/his101%5Cmisc%5Cpersia.htm |title=Notes on the Significance of the First Persian Empire in World History |publisher=Courses.wcupa.edu |date= |accessdate=2008-09-12}}</ref>

|-

|6

|[[碳]]

|前3750

|?

|埃及人和蘇美人

|?

|最早由埃及人和蘇美人在製青銅的過程中使用柴作銅、鋅和錫的碳還原法。<ref>{{cite web|url=http://www.caer.uky.edu/carbon/history/carbonhistory.shtml |title=History of Carbon and Carbon Materials - Center for Applied Energy Research - University of Kentucky |publisher=Caer.uky.edu |date= |accessdate=2008-09-12}}</ref>[[鑽石]]可能早在公元前2500年就爲人所知，<ref>{{cite news | url = http://news.bbc.co.uk/2/hi/science/nature/4555235.stm | title = Chinese made first use of diamond | publisher = BBC News | date= 17 May 2005 | accessdate = 2007-03-21}}</ref>於18世紀人們首次真正的作鑽石的化學分析， <ref>{{cite book |author=R-A Ferchault de Réaumur |last=Ferchault de Réaumur |first=R-A |year=1722 |title=L'art de convertir le fer forgé en acier, et l'art d'adoucir le fer fondu, ou de faire des ouvrages de fer fondu aussi finis que le fer forgé (English translation from 1956) |location=Paris, Chicago}}</ref>而在1789年被列爲元素。<ref>{{citeweb|author=Senese, Fred |date=September 9, 2009|url= http://antoine.frostburg.edu/chem/senese/101/inorganic/faq/discovery-of-carbon.shtm |title=Who discovered carbon?|publisher=Frostburg State University|accessdate=2007-11-24 }}</ref>

|-

|50

|[[錫]]

|前3500

|前2000

|?

|?

|人類首次於約公元前3500年煉製錫，並與銅合製[[紅銅]]和[[青銅]]。<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/sn.html |title=50 Tin |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>現存最早的工藝產於約公元前2000年。<ref>{{cite web|url=http://neon.mems.cmu.edu/cramb/Processing/history.html |title=History of Metals |publisher=Neon.mems.cmu.edu |date= |accessdate=2008-09-12}}</ref>

|-

|16

|[[硫]]

|前2000前

|?

|中國人/印度人

|?

|首次於約4000年前使用，<ref>{{cite web|url=http://www.georgiagulfsulfur.com/history.htm |title=Sulfur History |publisher=Georgiagulfsulfur.com |date= |accessdate=2008-09-12}}</ref>並於1777年由[[安托萬·拉瓦節]]確認為元素。

|-

|80

|[[汞]]

|前2000前

|前1500

||中國人/印度人

|[[埃及]]

|在公元前2000年前中國人和印度人就已經發現了汞，並於公元前1500年的埃及古墓中發現最早的樣本。<ref>{{cite web | title=Mercury and the environment — Basic facts | publisher=''[[Environment Canada]], Federal Government of Canada'' | year=2004 | url=http://www.ec.gc.ca/MERCURY/EN/bf.cfm | accessdate=2008-03-27}}</ref>

|-

|30

|[[鋅]]

|前1000前

|前1000

|印度冶金學者

|[[印度次大陸]]

|由印度冶金學者在3000年前煉得，但當時無人知道其真正特性。於800年由冶金學者Rasaratna Samuccaya，<ref name=Craddock>Craddock, P. T. et al. (1983), "Zinc production in medieval India", ''World Archaeology'' '''15''' (2), Industrial Archaeology, p. 13</ref>及於1526年由煉金術士[[帕拉塞尔苏斯]]確認為元素。<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/zn.html |title=30 Zinc |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>由[[马格拉夫]]於1746年分離出來。

|}

==有記錄的發現==

{| class="sortable wikitable"

|-

! | Z<br>

! | Element<br>name<br>

! | <small>Observed or<br>predicted<br>

! | <small>Report of<br>characterization<br>(widely recognized)</small><br><ref name=D1/><ref name=D2/>

! | <small>Isolation<br>(widely known)</small><br>

! | <small>Observer<br>

! | <small>Person who<br>widely reported first<br>characterization<br>(usually accepted discoverer)<br>

! | <small>First<br>isolator<br>

! class="unsortable"| Notes

|-

|33

|[[Arsenic]]

|0800 CE (ca.)

|?

|0800 CE (ca.)

|[[Geber]]

|[[Geber]] or [[Albertus Magnus|A.Magnus]]

|[[Geber]]

|Discovered and isolated by [[Geber]], who described its preparation in his ''Liber Fornacum'', ca. 800 CE.<ref name=Sarton>[[George Sarton]], ''Introduction to the History of Science'' ([[cf.]] Dr. A. Zahoor and Dr. Z. Haq (1997), [http://www.cyberistan.org/islamic/Introl1.html ''Quotations From Famous Historians of Science''], [http://www.cyberistan.org Cyberistan])</ref><ref name=Ansari>{{Cite book|title=Electrocyclic reactions: from fundamentals to research|first1=Farzana Latif|last1=Ansari|first2=Rumana|last2=Qureshi|first3=Masood Latif|last3=Qureshi|year=1998|publisher=Wiley-VCH|isbn=3527297553|pages=2}}</ref><ref>{{Cite journal|title=The History of Chemistry|first=Thomas|last=Thomson|publisher=Colburn and Bentley|year=1830|pages=129–30}}</ref> [[Albertus Magnus]] was the first European to isolate the element in 1250.<ref name=D1>{{cite web |url=http://www.chemicalelements.com/show/dateofdiscovery.html |title=Periodic Table: Date of Discovery|accessdate=2007-03-13}}</ref><ref name=D2>{{cite web |url=http://chemistry.about.com/library/das/aa030303a.htm |title=Timeline of Element Discovery|accessdate=2007-03-13}}</ref> In 1649, [[Johann Schröder]] published two ways of preparing elemental arsenic.

|-

|51

|[[Antimony]]

|0800 CE (ca.)

|

|0800 CE (ca.)

|[[Geber]]

|

|[[Geber]]

|Discovered and isolated by [[Geber]] ca. 800 CE.<ref name=Sarton/><ref name=Ansari/> [[Basilius Valentinus]] was the first European to describe the element around 1450.<ref name=D1/><ref name=D2/> First description of a procedure for isolating elemental antimony in 1540 by [[Vannoccio Biringuccio]].

|-

|83

|[[Bismuth]]

|0800 CE (ca.)

|

|1753

|[[Geber]]

|

|[[Claude François Geoffroy|C.F.Geoffroy]]

|Discovered by [[Geber]] ca. 800.<ref name=Ansari/><ref name=Briffault>[[Robert Briffault]] (1938), ''The Making of Humanity'', p. 195</ref> Later described in writings attributed to [[Basilius Valentinus]] around 1450.<ref name=D1/> Definitively identified by [[Claude François Geoffroy]] in 1753.<ref name=D2/>

|-

|15

|[[Phosphorus]]

|1669

|

|''1669''

|[[Hennig Brand|H.Brand]]

|

|''H.Brand''

|Prepared from urine, it was the first element to be chemically discovered.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/p.html |title=15 Phosphorus |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|27

|[[Cobalt]]

|1732

|

|?

|[[Georg Brandt|G.Brandt]]

|

|?

|Proved that the blue color of glass is due to a new kind of metal and not bismuth as thought previously.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/co.html |title=27 Cobalt |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|78

|[[Platinum]]

|1735

|

|''1735''

|[[Antonio de Ulloa|A.de Ulloa]]

|

|''A. de Ulloa''

|First description of a metal found in [[South America]]n gold was in 1557 by [[Julius Caesar Scaliger]]. Ulloa published his findings in 1748, but [[Charles Wood (scientist)|Sir Charles Wood]] also investigated the metal in 1741. First reference to it as a new metal was made by [[William Brownrigg]] in 1750.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/pt.html |title=78 Platinum |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|28

|[[Nickel]]

|1751

|

|''1751''

|[[Axel Fredrik Cronstedt|A.F.Cronstedt]]

|

|''A.F.Cronstedt''

|By attempting to extract copper from the mineral known as "fake copper" (now known as [[niccolite]]).<ref name="autogenerated4">{{cite web|url=http://elements.vanderkrogt.net/elem/ni.html |title=28 Nickel |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|12

|[[Magnesium]]

|1755

|

|1808

|[[Joseph Black|J.Black]]

|

|[[Humphry Davy|H.Davy]]

|Black observed that ''magnesia alba'' (MgO) was not [[quicklime]] (CaO). Davy isolated it electrochemically from [[Magnesia (mineral)|magnesia]].<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/mg.html |title=12 Magnesium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|1

|[[Hydrogen]]

|1766

|

|1500(ca.)

|[[Henry Cavendish|H.Cavendish]]

|

|[[Paracelsus]]

|Cavendish was the first to distinguish {{chem|H|2}} from other gases, although [[Paracelsus]] around 1500, Robert Boyle, and Joseph Priestley had observed its production by reacting strong acids with metals. Lavoisier named it in 1793.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/h.html |title=01 Hydrogen |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref><ref>{{cite book|title=The Encyclopedia of the Chemical Elements|last=Andrews|first=A. C.|publisher=Reinhold Book Corporation|location=New York|year=1968|pages=272|editor=Clifford A. Hampel|chapter=Oxygen|id=LCCN 68-29938}}</ref>

|-

|8

|[[Oxygen]]

|1771

|

|''1771''

|[[Carl Wilhelm Scheele|C.W.Scheele]]

|

|''C.W.Scheele''

|Obtained by heating [[mercuric oxide]] and [[nitrate]]s in 1771, but published his findings in 1777. [[Joseph Priestley]] also prepared this new ''air'' by 1774, but only Lavoisier recognized it as a true element and named it in 1777.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/o.html |title=08 Oxygen |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref><ref>{{cite book|title=The Encyclopedia of the Chemical Elements|last=Cook|first=Gerhard A.|coauthors=Lauer, Carol M.|publisher=Reinhold Book Corporation|location=New York|year=1968|pages=499–500|editor=Clifford A. Hampel|chapter=Oxygen|id=LCCN 68-29938}}</ref>

|-

|7

|[[Nitrogen]]

|1772

|

|''1772''

|[[Daniel Rutherford|D.Rutherford]]

|

|''D.Rutherford''

|He showed that the air in which animals had breathed, even after removal of the exhaled carbon dioxide, was no longer able to burn a candle. [[Carl Wilhelm Scheele]], [[Henry Cavendish]], and [[Joseph Priestley]] also studied the element about the same time, and Lavoisier named it in 1775-6.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/n.html |title=07 Nitrogen |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|17

|[[Chlorine]]

|1774

|

|''1774''

|[[Carl Wilhelm Scheele|C.W.Scheele]]

|

|''C.W.Scheele''

|Obtained it from [[hydrochloric acid]], but thought it was an oxide. Only in 1808 Humphry Davy recognized it as an element.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/cl.html |title=17 Chlorine |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|25

|[[Manganese]]

|1770

|

|1774

|[[Torbern Olof Bergman|T.O.Bergman]]

|

|[[Johan Gottlieb Gahn|J.G.Gahn]]

|Distinguished [[pyrolusite]] as the calx of a new metal. [[Ignatius Gottfred Kaim]] also discovered the new metal in 1770 and Scheele in 1774 too. It was isolated by reduction of [[manganese dioxide]] with carbon.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/mn.html |title=25 Manganese |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|56

|[[Barium]]

|1772

|

|1808

|[[Carl Wilhelm Scheele|C.W.Scheele]]

|

|[[Humphry Davy|H.Davy]]

|Scheele distinguished a new earth ([[BaO]]) in [[pyrolusite]] and Davy isolated the metal by [[electrolysis]].<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/ba.html |title=56 Barium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|42

|[[Molybdenum]]

|1778

|

|1781

|[[Carl Wilhelm Scheele|C.W.Scheele]]

|

|[[Peter Jacob Hjelm|P.J.Hjelm]]

|Scheele recognised as a constituent of [[Molybdenite|molybdena]].<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/mo.html |title=42 Molybdenum |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|52

|[[Tellurium]]

|1782

|

|1795?

|[[Franz-Joseph Müller von Reichenstein|F.-J.M. von<br>Reichenstein]]

|

|[[Martin Heinrich Klaproth|M.H.Klaproth]]

|Muller observed it as an impurity in gold ores from Transylvania.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/te.html |title=52 Tellurium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|74

|[[Tungsten]]

|1781

|

|1783

|[[Torbern Bergman|T.Bergman]]

|

|[[Juan José Elhuyar|J.J.Elhuyar]], [[Juan José|J.José]] &[[Fausto Elhuyar|F.Elhuyar]]

|Bergman obtained from [[scheelite]] an oxide of a new element. The Elhuyars obtained [[tungstic acid]] from [[wolframite]] and reduced it with charcoal.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/w.html |title=74 Tungsten |publisher=Elements.vanderkrogt.net |author=IUPAC |date= |accessdate=2008-09-12}}</ref>

|-

|38

|[[Strontium]]

|1787

|

|1808

|[[William Cruickshank (chemist)|W.Cruikshank]]

|

|H.Davy

|Cruikshank and [[Adair Crawford]] in 1790 concluded that [[strontianite]] contained a new earth. It was eventually isolated electrochemically in 1808 by Humphry Davy.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/sr.html |title=38 Strontium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

!

!

!'''''1789'''''

!

!

!colspan=1|[[Antoine Lavoisier|A.Lavoisier]]

!

!

!The first modern list of chemical elements, containing among others, 23 elements of those known then.<ref>{{cite web|url=http://homepage.mac.com/dtrapp/periodic.f/lavoisier.html |title=Lavoisier |publisher=Homepage.mac.com |date= |accessdate=2008-09-12}}</ref> He also redefined the term "element". Until him, all metals except mercury were not considered elements.

|-

|40

|[[Zirconium]]

|1789

|

|1824

|[[Martin Heinrich Klaproth|M.H.Klaproth]]

|

|[[Jöns Jakob Berzelius|J.J.Berzelius]]

|Klaproth identified the a new element in [[zirconia]].<ref>{{cite web|url=http://elements.vanderkrogt.net/chronology\_index.html |title=Chronology - Elementymology |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref><ref>{{Cite journal| contribution = Zirconium| year = 2007–2008| title = CRC Handbook of Chemistry and Physics| editor-last = Lide| editor-first = David R.| volume = 4| pages = 42| place = New York| publisher = CRC Press| id = 978-0-8493-0488-0}}</ref>

|-

|92

|[[Uranium]]

|1789

|

|1841

|[[Martin Heinrich Klaproth|M.H.Klaproth]]

|

|[[Eugène-Melchior Péligot|E.-M.Péligot]]

|Mistakenly identified an [[uranium oxide]] obtained from [[pitchblende]] as the element itself and named it after the recently discovered planet [[Uranus]].<ref>{{cite journal| title = Chemische Untersuchung des Uranits, einer neuentdeckten metallischen Substanz| author = [[Martin Heinrich Klaproth|M. H. Klaproth]]| journal = Chemische Annalen| volume = 2| issue =| year = 1789| pages = 387–403}}</ref><ref>{{cite journal| title = Recherches Sur L'Uranium| author = E.-M. Péligot| journal = [[Annales de chimie et de physique]]| volume = 5| issue = 5| year = 1842| pages = 5–47| url =http://gallica.bnf.fr/ark:/12148/bpt6k34746s/f4.table}}</ref>

|-

|22

|[[Titanium]]

|1791

|

|1825

|[[William Gregor|W.Gregor]]

|

|[[Jöns Jakob Berzelius|J.J.Berzelius]]

|Gregor found an oxide of a new metal in [[ilmenite]] and [[Martin Heinrich Klaproth]] independently discovered the element in [[rutile]] in 1795 and named it. Pure metallic form was obtained only in 1910 by [[Matthew A. Hunter]].<ref>{{cite web|title=Titanium|url=http://periodic.lanl.gov/elements/22.html|year=2004|accessdate=2006-12-29| publisher=[[Los Alamos National Laboratory]]}}</ref><ref>{{cite book |title=''The Encyclopedia of the Chemical Elements'' |year=1968 |author=Barksdale, Jelks |publisher=[[Reinhold Book Corporation]] |location=[[Skokie, Illinois]] |pages=732–38 "Titanium"|id=LCCCN 68-29938}}</ref>

|-

|39

|[[Yttrium]]

|1794

|

|1840

|[[Johan Gadolin|J.Gadolin]]

|

|[[Carl Gustav Mosander|C.G.Mosander]]

|Discovered in [[gadolinite]], but Mosander showed later that it contained more elements.<ref>{{cite journal|url=http://books.google.com/books?id=VV5KAAAAMAAJ&pg=PA46&lpg=PA46&dq=Yttrium+discovery&source=web&ots=kIrp-JqrS0&sig=Vjpm3O79VUAN-FiVRKaSmuCalbg&hl=en&sa=X&oi=book\_result&resnum=9&ct=result|journal=Kongl. Vet. Acad. Handl.|volume=XV|pages=137 | title = Introduction to the Rarer Elements|doi=10.1103/|doi\_brokendate=2009-11-14}}</ref><ref>{{citejournal|year=1796|journal=Crell Anal.|volume=I|pages=313 | title =. }}</ref>

|-

|24

|[[Chromium]]

|1797

|

|1798

|[[Louis Nicolas Vauquelin|L.N.Vauquelin]]

|

|''L.N.Vauquelin''

|Discovered and isolated from [[crocoite]].<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/cr.html |title=24 Chromium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|4

|[[Beryllium]]

|1798

|

|1828

|[[Louis Nicolas Vauquelin|L.N.Vauquelin]]

|

|[[Friedrich Wöhler|F.Wöhler]]&[[Antoine Bussy|A.Bussy]]

|Vauquelin discovered the oxide in [[beryl]] and emerald, and Klaproth suggested the present name around 1808.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/be.html |title=04 Beryllium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|23

|[[Vanadium]]

|1801

|

|1830

|[[Andrés Manuel del Río|A.M.del Río]]

|

|[[Nils Gabriel Sefström|N.G.Sefström]]

|Río found the metal in [[vanadinite]] but retracted the claim after [[Hippolyte Victor Collet-Descotils]] disputed it. Sefström isolated and named it, and later it was shown that Río had been right in the first place.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/v.html |title=23 Vanadium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|41

|[[Niobium]]

|1801

|

|1864

|[[Charles Hatchett|C.Hatchett]]

|

|[[Christian Wilhelm Blomstrand|C.W.Blomstrand]]

|Hatchett found the element in [[columbite]] ore and named it ''columbium''. [[Heinrich Rose]] proved in 1844 that the element is distinct from tantalum, and renamed it ''niobium'' which was officially accepted in 1949.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/nb.html |title=41 Niobium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|73

|[[Tantalum]]

|1802

|

|?

|[[Anders Gustaf Ekeberg|A.G.Ekeberg]]

|

|?

|Ekeberg found another element in minerals similar to [[columbite]] and in 1844, Heinrich Rose proved that it was distinct from niobium.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/ta.html |title=73 Tantalum |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|46

|[[Palladium]]

|1803

|

|''1803''

|[[William Hyde Wollaston|W.H.Wollaston]]

|

|''W.H.Wollaston''

|Wollaston discovered it in samples of platinum from South America, but did not publish his results immediately. He had intended to name it after the newly discovered [[asteroid]], [[Ceres (dwarf planet)|Ceres]], but by the time he published his results in 1804, cerium had taken that name. Wollaston named it after the more recently discovered asteroid [[2 Pallas|Pallas]].<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/pd.html |title=46 Palladium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|58

|[[Cerium]]

|1803

|

|1839

|[[Martin Heinrich Klaproth|M.H.Klaproth]],<br>[[Jöns Jakob Berzelius|J.J.Berzelius]] &<br>[[Wilhelm Hisinger|W.Hisinger]]

|

|[[Carl Gustaf Mosander|C.G.Mosander]]

|Berzelius and Hisinger discovered the element in [[ceria]] and named it after the newly discovered [[asteroid]] (then considered a planet), [[Ceres (dwarf planet)|Ceres]]. Klaproth discovered it simultaneously and independently in some tantalum samples. Mosander proved later that the samples of all three researchers had at least another element in it, [[lanthanum]].<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/ce.html |title=58 Cerium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|76

|[[Osmium]]

|1803

|

|''1803''

|[[Smithson Tennant|S.Tennant]]

|

|''S.Tennant''

|Tennant had been working on samples of South American platinum in parallel with Wollaston and discovered two new elements, which he named osmium and iridium.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/os.html |title=76 Osmium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|77

|[[Iridium]]

|1803

|

|''1803''

|[[Smithson Tennant|S.Tennant]]

|

|''S.Tennant''

|Tennant had been working on samples of South American platinum in parallel with Wollaston and discovered two new elements, which he named osmium and iridium, and published the iridium results in 1804.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/ir.html |title=77 Iridium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|45

|[[Rhodium]]

|1804

|

|''1804''

|[[William Hyde Wollaston|W.H.Wollaston]]

|

|''W.H.Wollaston''

|Wollaston discovered and isolated it from crude platinum samples from South America.<ref name="autogenerated2">{{cite web|url=http://elements.vanderkrogt.net/elem/rh.html |title=45 Rhodium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|19

|[[Potassium]]

|1807

|

|''1807''

|[[Humphry Davy|H.Davy]]

|

|''H.Davy''

|Davy discovered it by using [[electrolysis]] on [[potash]].<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/k.html |title=19 Potassium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|11

|[[Sodium]]

|1807

|

|''1807''

|[[Humphry Davy|H.Davy]]

|

|''H.Davy''

|Davy discovered it a few days after potassium, by using [[electrolysis]] on [[soda]].<ref name="autogenerated1">{{cite web|url=http://elements.vanderkrogt.net/elem/na.html |title=11 Sodium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|20

|[[Calcium]]

|1808

|

|''1808''

|[[Humphry Davy|H.Davy]]

|

|''H.Davy''

|Davy discovered the metal by [[electrolysis]] of [[quicklime]].<ref name="autogenerated1" />

|-

|5

|[[Boron]]

|1808

|

|1808

|[[Joseph Louis Gay-Lussac|J.L.Gay-Lussac]] &<br>[[Louis Jacques Thénard|L.J.Thénard]]

|

|[[Humphry Davy|H.Davy]]

|On June 30, 1808, Lussac and Thénard announced a new element in [[boric acid|sedative salt]], and nine days later Davy announced the isolation of metallic boron.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/b.html |title=05 Boron |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|53

|[[Iodine]]

|1811

|

|''1811''

|[[Bernard Courtois|B.Courtois]]

|

|''B.Courtois''

|Courtois discovered it in the ashes of [[sea weed]].<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/i.html |title=53 Iodine |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|3

|[[Lithium]]

|1817

|

|''1817''

|[[Johan August Arfwedson|J.A.Arfwedson]]

|

|''J.A.Arfwedson''

|Arfwedson discovered the alkali in [[petalite]].<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/li.html |title=03 Lithium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|48

|[[Cadmium]]

|1817

|

|''1817''

|[[Karl Samuel Leberecht Hermann|K.S.L Hermann]],<br>[[Friedrich Stromeyer|F.Stromeyer]]&<br>[[J.C.H. Roloff]]

|

|''K.S.L Hermann,<br>F. Stromeyer,<br>J.C.H. Roloff''

|All three found an unknown metal in a sample of [[zinc oxide]] from Silesia, but the name that Stromeyer gave became the accepted one.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/cd.html |title=48 Cadmium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|34

|[[Selenium]]

|1817

|

|''1817''

|[[Jöns Jakob Berzelius|J.J.Berzelius]] &<br>[[Johann Gottlieb Gahn|J.G.Gahn]]

|

|''J.J.Berzelius &<br>J.G.Gahn''

|While working with lead they discovered a substance that they thought it is tellurium, and after realizing it is different.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/se.html |title=34 Selenium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|14

|[[Silicon]]

|1824

|

|''1824''

|[[Jöns Jakob Berzelius|J.J.Berzelius]]

|

|''J.J.Berzelius''

|[[Humphry Davy]] thought in 1800 that [[silica]] is an element, not a compound, and in 1808 suggested the present name. In 1811 Louis-Joseph Gay-Lussac and Louis-Jacques Thénard probably prepared impure silicon, but Berzelius is credited with the discovery for obtaining the pure element in 1824.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/si.html |title=14 Silicon |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|13

|[[Aluminium]]

|1825

|

|''1825''

|[[Hans Christian Ørsted|H.C.Ørsted]]

|

|''H.C.Ørsted''

|[[Antoine Lavoisier]] predicted in 1787 that [[alumine]] is the oxide of an undiscovered element, and in 1808 [[Humphry Davy]] tried to decompose it, and although failed, suggested the present name. [[Hans Christian Ørsted]] was the first to isolate metallic aluminum in 1825.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/al.html |title=13 Aluminium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|35

|[[Bromine]]

|1825

|

|''1825''

|[[Antoine Jérôme Balard|A.J.Balard]],<br>[[Leopold Gmelin|L.Gmelin]]

|

|''A.J.Balard &<br>L.Gmelin''

|They both discovered the element in the Autumn of 1825, and published the results next year.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/br.html |title=35 Bromine |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|90

|[[Thorium]]

|1829

|

|?

|[[Jöns Jakob Berzelius|J.J.Berzelius]]

|

|?

|Berzelius obtained the oxide of a new earth in [[thorite]].<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/th.html |title=90 Thorium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|57

|[[Lanthanum]]

|1838

|

|?

|[[Carl Gustaf Mosander|C.G.Mosander]]

|

|?

|Mosander found a new element in samples of [[ceria]] and published his results in 1842, but later, he showed that this [[lanthana]] contained four more elements.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/la.html |title=57 Lanthanum |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|68

|[[Erbium]]

|1842

|

|?

|[[Carl Gustaf Mosander|C.G.Mosander]]

|

|?

|Mosander managed to split the old [[yttria]] into yttria proper and [[erbia]], and later [[terbia]] too.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/er.html |title=68 Erbium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|65

|[[Terbium]]

|1842

|

|''1842''

|[[Carl Gustaf Mosander|C.G.Mosander]]

|

|''C.G.Mosander''

|In 1842 Mosander split [[yttria]] into two more earths, [[erbia]] and [[terbia]]<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/tb.html |title=65 Terbium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|44

|[[Ruthenium]]

|1807

|

|1807

|[[Jedrzej Sniadecki|J.Sniadecki]]

|

|''J.Sniadecki''

|Sniadecki isolated the element in 1807 but his work was not ratified. [[Gottfried Wilhelm Osann]] thought he found three new metals in Russian platinum samples, and in 1844, [[Karl Ernst Claus|Karl Karlovich Klaus]] confirmed that there was a new element. The latter is usually recognized as the discoverer of the element.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/ru.html |title=44 Ruthenium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|55

|[[Caesium]]

|1860

|

|1882

|[[Robert Bunsen|R.W.Bunsen]] &<br>[[Gustav Kirchhoff|G.R.Kirchhoff]]

|

|[[Carl Setterberg|C.Setterberg]]

|Bunsen and Kirchhoff were the first to suggest finding new elements by [[spectrum analysis]]. They discovered caesium by its two blue [[emission line]]s in a sample of [[Dürkheim]] [[mineral water]].<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/cs.html |title=55 Caesium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref> The pure metal was eventually isolated in 1962 by Setterberg.<ref>[http://www.chem.shef.ac.uk/chm131-2001/chb01jms/caesium.html Ceasium<!-- Bot generated title -->]</ref>

|-

|37

|[[Rubidium]]

|1861

|

|?

|[[Robert Bunsen|R.W.Bunsen]] &<br>[[Gustav Kirchhoff|G.R.Kirchhoff]]

|

|[[Hevesy]]

|Bunsen and Kirchhoff discovered it just a few months after caesium, by observing new spectral lines in the mineral [[lepidolite]]. Bunsen never obtained a pure sample of the metal, which was later obtained by Hervesy.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/rb.html |title=37 Rubidium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|81

|[[Thallium]]

|1861

|

|1862

|[[William Crookes|W.Crookes]]

|

|[[Claude-Auguste Lamy|C.-A.Lamy]]

|Shortly after the discovery of rubidium, Crookes found a new green line in a selenium sample and later that year, Lamy found the element to be metallic.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/tl.html |title=81 Thallium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|49

|[[Indium]]

|1863

|

|1867

|[[Ferdinand Reich|F.Reich]] &<br>[[Hieronymous Theodor Richter|H.T.Richter]]

|

|T.Richter

|Riach and Richter First identified it in [[sphalerite]] by its birght indigo-blue spectroscopic emission line. Richter isolated the metal several years later.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/in.html |title=49 Indium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|2

|[[Helium]]

|1868

|

|1895

|[[Pierre Janssen|P.Janssen]] &<br>[[Joseph Norman Lockyer|J.N.Lockyer]]

|

|[[Sir William Ramsay|W.Ramsay]],<br>[[Per Theodor Cleve|P.T.Cleve]]&<br>[[Nils Langlet|N.Langlet]]

|Janssen and Lockyer observed independently a yellow spectral line in the solar spectrum that did not match any other element.

Years later, Ramsay, Cleve, and Langlet observed independently the element trapped in [[cleveite]] about the same time.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/he.html |title=02 Helium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

!

!

!'''''1869'''''

!

!

!|<center> [[Dmitri Mendeleev|D.I.Mendeleev]]

!

!

!Mendeleev arranges the 63 elements known at that time into the first modern periodic table and correctly predicts several others.

|-

|31

|[[Gallium]]

|1875

|

|?

|[[Paul Emile Lecoq de Boisbaudran|P.E.L.de<br>Boisbaudran]]

|

|''P.E.L.de Boisbaudran''

|Boisbaudran observed on a Pyrenea [[blende]] sample some emission lines corresponding to the eka-aluminum that was [[Mendeleev's predicted elements|predicted]] by [[Mendeleev]] in 1871 and subsequently isolated the element by electrolysis.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/ga.html |title=31 Gallium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|70

|[[Ytterbium]]

|1878

|

|?

|[[Jean Charles Galissard de Marignac|J.C.G. de<br>Marignac]]

|

|?

|In October 22, 1878, Marignac reported splitting [[terbia]] in two new earths, terbia proper and [[ytterbia]].<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/yb.html |title=70 Ytterbium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|67

|[[Holmium]]

|1878

|

|?

|[[Marc Delafontaine|M.Delafontaine]] <!-- ??[[Jacques-Louis Soret|J.-L.Soret]] and [[Per Teodor Cleve|P.T.Cleve]]?? -->

|

|?

|Delafontaine found it in [[samarskite]] and next year, Per Teodor Cleve split Marignac's [[erbia]] into erbia proper and two new elements, thulium and holmium.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/ho.html |title=67 Holmium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|69

|[[Thulium]]

|1879

|

|''1879''

|[[Per Teodor Cleve|P.T.Cleve]]

|

|''P.T.Cleve''

|Cleve split Marignac's [[erbia]] into erbia proper and two new elements, thulium and holmium.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/tm.html |title=69 Thulium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|21

|[[Scandium]]

|1879

|

|''1879''

|[[Lars Fredrik Nilson|L.F.Nilson]]

|

|''L.F.Nilson''

|Nilson split Marignac's [[ytterbia]] into pure one and a new element that matched [[Mendeleev's predicted elements|1871 Mendeleev's predicted]] eka-boron.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/sc.html |title=21 Scandium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|62

|[[Samarium]]

|1879

|

|''1879''

|[[Paul Emile Lecoq de Boisbaudran|P.E.L. de<br>Boisbaudran]]

|

|''P.E.L. de<br>Boisbaudran''

|Boisbaudran noted a new earth in [[samarskite]] and named it after the mineral.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/sm.html |title=62 Samarium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|64

|[[Gadolinium]]

|1880

|

|1886

|[[Jean Charles Galissard de Marignac|J.C.G. de<br>Marignac]]

|

|[[François Lecoq de Boisbaudran|F.L. de<br>Boisbaudran]]

|Marignac initially observed the new earth in [[terbia]] and later, Boisbaudran obtained a pure sample from [[samarskite]].<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/gd.html |title=64 Gadolinium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|59

|[[Praseodymium]]

|1885

|

|?

|[[Carl Auer von Welsbach|C.A.von Welsbach]]

|

|?

|Von Welsbach discovered two new distinct elements in [[ceria]]: praseodymium and neodymium.<ref name="autogenerated3">{{cite web|url=http://elements.vanderkrogt.net/elem/pr.html |title=59 Praseodymium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|60

|[[Neodymium]]

|1885

|

|?

|[[Carl Auer von Welsbach|C.A.von Welsbach]]

|

|?

|Von Welsbach discovered two new distinct elements in [[ceria]]: praseodymium and neodymium.<ref name="autogenerated5">{{cite web|url=http://elements.vanderkrogt.net/elem/nd.html |title=60 Neodymium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|66

|[[Dysprosium]]

|1886

|

|?

|[[Paul Emile Lecoq de Boisbaudran|P.E.L. de<br>Boisbaudran]]

|

|?

|De Boisbaudran found a new earth in [[erbia]].<ref name="autogenerated5" />

|-

|32

|[[Germanium]]

|1886

|

|?

|[[Clemens Winkler|C.A.Winkler]]

|

|?

|In February 1886 Winkler found in [[argyrodite]] the eka-silicon that [[Mendeleev's predicted elements|Mendeleev had predicted in 1871]].<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/ge.html |title=32 Germanium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|9

|[[Fluorine]]

|1886

|

|''1886''

|[[Henri Moissan|H.Moissan]]

|

|''H.Moissan''

|Lavoisier predicted an element obtained from [[hydrofluoric acid]] and between 1812 and 1886 many researchers tried to obtain this element. It was eventually isolated by Moissan.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/f.html |title=09 Fluorine |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|18

|[[Argon]]

|1894

|

|''1894''

|[[John Strutt, 3rd Baron Rayleigh|Lord Rayleigh]] &<br>[[William Ramsay|W.Ramsay]]

|

|''Lord Rayleigh &<br>W.Ramsay''

|They discovered the gas by comparing the molecular weights of nitrogen prepared by [[liquefaction]] from air and nitrogen prepared by chemical means. It is the first noble gas to be isolated.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/ar.html |title=18 Argon |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|36

|[[Krypton]]

|1898

|

|1898

|[[William Ramsay|W.Ramsay]] &<br>[[Morris W. Travers|M.W.Travers]]

|

|''W.Ramsay &<br>M.W.Travers''

|On May 30, 1898, Ramsay separated a third noble gas from liquid argon by difference in boiling point.<ref name="autogenerated6">{{cite web|url=http://elements.vanderkrogt.net/elem/ne.html |title=10 Neon |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|10

|[[Neon]]

|1898

|

|1898

|[[William Ramsay|W.Ramsay]] &<br>[[Morris W. Travers|M.W.Travers]]

|

|''W.Ramsay &<br>M.W.Travers''

|In June 1898 Ramsay separated a new noble gas from liquid argon by difference in boiling point.<ref name="autogenerated6" />

|-

|54

|[[Xenon]]

|1898

|

|1898

|[[William Ramsay|W.Ramsay]] &<br>[[Morris W. Travers|M.W.Travers]]

|

|''W.Ramsay &<br>M.W.Travers''

|On July 12, 1898 Ramsay separated a third noble gas within three weeks, from liquid argon by difference in boiling point.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/xe.html |title=54 Xenon |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|84

|[[Polonium]]

|1898

|

|1902

|[[Pierre Curie|P.Curie]] &<br>[[Marie Curie|M.Curie]]

|

|[[Willy Marckwald|W.Marckwald]]

|In an experiment done on July 13, 1898, the Curies noted an increased radioactivity in the uranium obtained from [[pitchblende]] which they assigned to an unknown element.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/po.html |title=84 Polonium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|88

|[[Radium]]

|1898

|

|1902

|[[Pierre Curie|P.Curie]] &<br>[[Marie Curie|M.Curie]]

|

|M. Curie

|The Curies reported on December 26, 1898, a new element different from polonium, which Marie later isolated from [[uraninite]].<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/ra.html |title=88 Radium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|86

|[[Radon]]

|1898

|

|1910

|[[Friedrich Ernst Dorn|F.E.Dorn]]

|

|[[William Ramsay|W.Ramsay]] &<br>[[Robert Whytlaw-Gray|R.Whytlaw-Gray]]

|Dorn discovered a radioactive gas resulting from the radioactive decay of radium, isolated later by Ramsay and Gray.<ref>{{cite journal|title=Discovery of Radon|journal=[[Nature (journal)|Nature]]|volume=179|issue=4566|page=912|month=May | year=1957|author=Partington, J. R.|doi=10.1038/179912a0}}</ref><ref>{{cite journal | title = La densité de l’emanation du radium | author = Ramsay, W.; Gray, R. W. | journal = Comptes rendus hebdomadaires des seances de l'Academie des sciences | volume = 151 | pages = 126–128 | year = 1910 | url = http://gallica.bnf.fr/ark:/12148/bpt6k31042/f126.table }}</ref>

|-

|89

|[[Actinium]]

|1899

|

|''1899''

|[[André-Louis Debierne|A.-L.Debierne]]

|

|''A.-L.Debierne''

|Debierne obtained from pitchblende a substance that had similar properties to thorium.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/ac.html |title=89 Actinium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|63

|[[Europium]]

|1896

|

|1901

|[[Eugene Demarcay|E.Demarcay]]

|

|''E.Demarcay''

|Demarçay found spectral lines of a new element in Lecoq's samarium, and separated this element several years later.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/eu.html |title=63 Europium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|71

|[[Lutetium]]

|1906

|

|''1906''

|[[Georges Urbain|G.Urbain]],<br>[[Carl Auer von Welsbach|C.A. von<br>Welsbach]]

|

|''G. Urbain &<br>C.A. von Welsbach''

|Urbain and von Welsbach proved independently that the old [[ytterbium]] did also contain a new element.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/lu.html |title=71 Lutetium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|75

|[[Rhenium]]

|1908

|

|''1908''

|[[Masataka Ogawa|M.Ogawa]]

|

|''M.Ogawa''

|Ogawa found it in [[thorianite]] but assigned it is element 43 instead of 75 and named it ''nipponium''.<ref>http://www.maik.ru/abstract/radchem/0/radchem0535\_abstract.pdf</ref> In 1922 [[Walter Noddack]], [[Ida Noddack|Ida Eva Tacke]] and [[Otto Berg (scientist)|Otto Berg]] announced its separation from [[gadolinite]] and gave it the present name.<ref name="autogenerated2" />

|-

|72

|[[Hafnium]]

|1911

|

|1922

|[[Georges Urbain|G.Urbain]],<br>[[Vladimir Vernadsky|V.I.Vernadsky]]

|

|[[Dirk Coster|D.Coster]] &<br>[[Georg von Hevesy|G. von<br>Hevesy]]

|Urbain claimed to have found the element in rare-earth residues, while [[Vladimir Vernadsky|Vernadsky]] independently found it in [[orthite]]. Neither claims was confirmed due to the [[World War I]]. After it, Coster and Hevesy found it by X-ray spectroscopic analysis in Norwegian zircon.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/hf.html |title=72 Hafnium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref> It is the last stable element to be discovered.

|-

|91

|[[Protactinium]]

|1913

|

|?

|[[Otto H. Göhring|O.H.Göhring]],<br>[[Kasimir Fajans|K.Fajans]]

|

|?

|The two obtained the first isotope of this element that had been [[Mendeleev's predicted elements|predicted by Mendeleev in 1871]] as a member of the natural decay of <sup>238</sup>U.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/pa.html |title=91 Protactinium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref> Originally isolated in 1900 by [[William Crookes]].<ref> {{cite book | last = Emsley | first = John | title = Nature's Building Blocks | edition = (Hardcover, First Edition) | publisher = [[Oxford University Press]] | year = 2001 | pages = 347 | isbn = 0198503407 }}</ref>

|-

|43

|[[Technetium]]

|1937

|

|''1937''

|[[Carlo Perrier|C.Perrier]],<br>[[Emilio Segrè|E.Segrè]]

|

|''C.Perrier & E.Segrè''

|The two discovered a new element in a molybdenum that was used in a [[cyclotron]], the first [[synthetic element]] to be discovered. It had been [[Mendeleev's predicted elements|predicted by Mendeleev in 1871]] as eka-manganese.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/tc.html |title=43 Technetium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref><ref>''History of the Origin of the Chemical Elements and Their Discoverers'', Individual Element Names and History, "Technetium"</ref>

|-

|87

|[[Francium]]

|1939

|

|''1939''

|[[Marguerite Perey|M.Perey]]

|

|''M.Perey''

|Perey discovered it as a decay product of <sup>227</sup>Ac.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/fr.html |title=87 Francium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref> Francium is the last element to be discovered in nature, rather than synthesized in the lab, although some of the "synthetic" elements that were discovered later (plutonium, neptunium, astatine) were eventually found in trace amounts in nature as well.

|-

|85

|[[Astatine]]

|1940

|

|?

|[[Dale R. Corson|D.R.Corson]],<br>[[K.R.Mackenzie]],<br>[[Emilio Segrè|E.Segrè]]

|

|?

|Obtained by bombarding bismuth with alpha particles.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/at.html |title=85 Astatine |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref> Later determined to occur naturally in minuscule quantitites (<25 grams in earth's crust).

|-

|93

|[[Neptunium]]

|1940

|

|?

|[[Edwin McMillan|E.M. McMillan]],<br>[[Philip H. Abelson|P.H.Abelson]]

|

|?

|Obtained by irradiating uranium with neutrons, it is the first [[transuranium element]] discovered.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/np.html |title=93 Neptunium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|94

|[[Plutonium]]

|1940-1

|

|?

|[[Glenn T. Seaborg|G.T.Seaborg]],<br>[[Arthur Wahl|Arthur C. Wahl]],<br>[[Joseph W. Kennedy|J.K.Kennedy]],<br>[[Edwin M. McMillan|E.M.McMillan]]

|

|?

|Prepared by bombardment of uranium with deuterons.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/pu.html |title=94 Plutonium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|95

|[[Americium]]

|1944

|

|?

|[[Glenn T. Seaborg|G.T.Seaborg]],<br>[[Ralph A. James|R.A.James]],<br>[[Leon O. Morgan|L.O.Morgan]] &<br>[[Albert Ghiorso|A.Ghiorso]]

|

|?

|Prepared by irradiating plutonium with neutrons during the [[Manhattan Project]].<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/am.html |title=95 Americium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|96

|[[Curium]]

|1944

|

|?

|[[Glenn T. Seaborg|G.T.Seaborg]],<br>[[Ralph A. James|R.A.James]],<br>[[Albert Ghiorso|A.Ghiorso]]

|

|?

|Prepared by bombarding plutonium with alpha particles during the [[Manhattan Project]]<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/cm.html |title=96 Curium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|61

|[[Promethium]]

|1942

|

|1945

|[[Chien Shiung Wu|C.S.Wu]],<br>[[Emilio G. Segrè|E.G.Segrè]],<br>[[Hans Albrecht Bethe|H.A.Bethe]]

|

|[[Charles D. Coryell]], [[Jacob A. Marinsky]], [[Lawrence E. Glendenin]], [[Harold G. Richter]]

|It was probably first prepared in 1942 by bombarding neodymium and praseodymium with neutrons, but separation of the element could not be carried out. Isolation was performed under the [[Manhattan Project]] in 1945.<ref name="autogenerated3" />

|-

|97

|[[Berkelium]]

|1949

|

|?

|[[Stanley G. Thompson|S.G.Thompson]],<br>[[Albert Ghiorso|A.Ghiorso]],<br>[[Glenn T. Seaborg|G.T.Seaborg]]<br><small>([[University of California, Berkeley]])

|

|?

|Created by bombardment of americium with alpha particles.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/bk.html |title=97 Berkelium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|98

|[[Californium]]

|1950

|

|?

|[[Stanley G. Thompson|S.G.Thompson]],<br>[[Kenneth Street, Jr.|K.Street,Jr.]],<br>[[Albert Ghiorso|A.Ghiorso]],<br>[[Glenn T. Seaborg|G.T.Seaborg]] <br><small>([[University of California, Berkeley]])

|

|?

|Bombardment of curium with alpha particles.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/cf.html |title=98 Californium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|99

|[[Einsteinium]]

|1952

|

|1952

|[[Albert Ghiorso|A.Ghiorso]]<br><small>et al. ([[Argonne Laboratory]], [[Los Alamos Laboratory]], and [[University of California, Berkeley]])

|

|

|Formed in the first thermonuclear explosion in November 1952, by irradiation of uranium with neutrons and kept secret for several years.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/es.html |title=99 Einsteinium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|100

|[[Fermium]]

|1952

|

|?

|[[Albert Ghiorso|A.Ghiorso]]<br><small>et al. ([[Argonne Laboratory]], [[Los Alamos Laboratory]], and [[University of California, Berkeley]])

|

|

|Formed in the first thermonuclear explosion in November 1952, by irradiation of uranium with neutrons and kept secret for several years.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/fm.html |title=100 Fermium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|101

|[[Mendelevium]]

|1955

|

|?

|[[Albert Ghiorso|A.Ghiorso]],<br>[[Bernard G. Harvey|B.G.Harvey]],<br>[[Gregory R. Choppin|G.R.Choppin]],<br>[[Stanley G. Thompson|S.G.Thompson]],<br>[[Glenn T. Seaborg|G.T.Seaborg]]

|

|?

|Prepared by bombardment of einsteinium with helium.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/md.html |title=101 Mendelevium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|102

|[[Nobelium]]

|1958

|

|?

|[[Albert Ghiorso|A.Ghiorso]],<br>[[Torbjørn Sikkeland|T.Sikkeland]],<br>[[J.R. Walton|J.R.Walton]],<br>[[Glenn T. Seaborg|G.T.Seaborg]]

|

|?

|First prepared by bombardment of curium with carbon atoms.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/no.html |title=102 Nobelium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|103

|[[Lawrencium]]

|1961

|

|?

|[[Albert Ghiorso|A.Ghiorso]],<br>[[Torbjørn Sikkeland|T.Sikkeland]],<br>[[Almon E. Larsh|A.E.Larsh]],<br>[[Robert M. Latimer|R.M.Latimer]]

|

|?

|First prepared by bombardment of californium with boron atoms.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/lr.html |title=103 Lawrencium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|104

|[[Rutherfordium]]

|1964

|

|?

|[[Georgy Flyorov|G.N.Flerov]]<br><small>et al. at [[Joint Institute for Nuclear Research|JINR in Dubna]]

|

|?

|Prepared by bombardment of plutonium with neon atoms.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/rf.html |title=104 Rutherfordium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|105

|[[Dubnium]]

|1968

|

|?

|[[Georgy Flyorov|G.N.Flerov]]<br><small>et al. at [[Joint Institute for Nuclear Research|JINR in Dubna]]

|

|?

|By bombardment of americium with neon atoms.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/db.html |title=105 Dubnium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|106

|[[Seaborgium]]

|1974

|

|?

|[[Albert Ghiorso|A.Ghiorso]]<br><small>et al. in [[University of California, Berkeley]]

|

|?

|Collisions of californium-249 with oxygen atoms.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/sg.html |title=106 Seaborgium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|107

|[[Bohrium]]

|1981

|

|?

|[[Gottfried Münzenberg|G.Münzenberg]]<br><small>et al. [[Gesellschaft für Schwerionenforschung|GSI in Darmstadt]]

|

|?

|Obtained by bombarding bismuth with chromium.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/bh.html |title=107 Bohrium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|109

|[[Meitnerium]]

|1982

|

|?

|[[Gottfried Münzenberg|G.Münzenberg]],<br>[[Peter Armbruster|P.Armbruster]]<br><small>et al. [[Gesellschaft für Schwerionenforschung|GSI in Darmstadt]]

|

|?

|Bombardment of bismuth with iron atoms.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/mt.html |title=109 Meitnerium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|108

|[[Hassium]]

|1984

|

|?

|[[Gottfried Münzenberg|G.Münzenberg]],<br>[[Peter Armbruster|P.Armbruster]]<br><small>et al. at [[Gesellschaft für Schwerionenforschung|GSI in Darmstadt]]

|

|?

|Bombardment of lead with iron atoms<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/hs.html |title=108 Hassium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|110

|[[Darmstadtium]]

|1994

|

|?

|[[Sigurd Hofmann|S.Hofmann]]<br><small>et al. at [[Gesellschaft für Schwerionenforschung|GSI in Darmstadt]]

|

|?

|Bombardment of lead with nickel.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/ds.html |title=110 Darmstadtium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|111

|[[Roentgenium]]

|1994

|

|?

|[[Sigurd Hofmann|S.Hofmann]]<br><small>et al. at [[Gesellschaft für Schwerionenforschung|GSI in Darmstadt]]

|

|?

|Bombardment of bismuth with nickel.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/rg.html |title=111 Roentgenium |publisher=Elements.vanderkrogt.net |date= |accessdate=2008-09-12}}</ref>

|-

|112

|[[Ununbium]]<br><small>(Copernicium)

|1996

|

|?

|[[Sigurd Hofmann|S.Hofmann]]<br><small>et al. at [[Gesellschaft für Schwerionenforschung|GSI in Darmstadt]]

|

|?

|Bombardment of lead with zinc.<ref>{{cite web|url=http://elements.vanderkrogt.net/elem/uub.html |title=112 Ununbium |publisher=Elements.vanderkrogt.net |date= |accessdate=2009-07-17}}</ref><ref>{{cite web|url=http://www.iupac.org/web/nt/2009-06-26\_Uub |title=Discovery of the Element with Atomic Number 112 |publisher=www.iupac.org |date=2009-06-26 |accessdate=2009-07-17}}</ref>

|}

==Unconfirmed discoveries==

{| class="sortable wikitable"

|-

! | Z<br>

! | Name<br>

! | Discovery<br>year<br>

! | Discoverer<br>

! class="unsortable"| Notes

|-

|114

|[[Ununquadium]]

|1999

|[[Joint Institute for Nuclear Research]] in [[Dubna]]

|<ref>{{cite journal | last = Oganessian | first = Yu. Ts. | year = 1999 | month = October | title = Synthesis of Superheavy Nuclei in the <sup>48</sup>Ca + <sup>244</sup>Pu Reaction | journal = Physical Review Letters | volume = 83 | pages = 3154 | doi = 10.1103/PhysRevLett.83.3154 | url = http://link.aps.org/abstract/PRL/v83/p3154 | last2 = Utyonkov | first2 = V. K. | last3 = Lobanov | first3 = Yu. V. | last4 = Abdullin | first4 = F. Sh. | last5 = Polyakov | first5 = A. N. | last6 = Shirokovsky | first6 = I. V. | last7 = Tsyganov | first7 = Yu. S. | last8 = Gulbekian | first8 = G. G. | last9 = Bogomolov | first9 = S. L. }}</ref>

|-

| 116

|[[Ununhexium]]

|2000

|[[Joint Institute for Nuclear Research]] in [[Dubna]]

|<ref>{{cite journal | last = Oganessian | first = Yu. Ts. | year = 2000 | title = Observation of the decay of <sup>292</sup>116 | journal = Physical Review C | volume = 63 | pages = 011301 | doi = 10.1103/PhysRevC.63.011301 | url = http://link.aps.org/abstract/PRC/v63/e011301 | last2 = Utyonkov | first2 = V. K. | last3 = Lobanov | first3 = Yu. V. | last4 = Abdullin | first4 = F. Sh. | last5 = Polyakov | first5 = A. N. | last6 = Shirokovsky | first6 = I. V. | last7 = Tsyganov | first7 = Yu. S. | last8 = Gulbekian | first8 = G. G. | last9 = Bogomolov | first9 = S. L. }}</ref>

|-

| 118

|[[Ununoctium]]

|2002

| [[Joint Institute for Nuclear Research]] in Dubna and [[Lawrence Livermore National Laboratory]]

|<ref>{{cite journal | last = Oganessian | first = Yu. Ts. | year = 2006 | title = Synthesis of the isotopes of elements 118 and 116 in the <sup>249</sup>Cf and <sup>245</sup>Cm+<sup>48</sup>Ca fusion reactions | journal = Physical Review C | volume = 74 | pages = 044602 | doi = 10.1103/PhysRevC.74.044602 | url = http://link.aps.org/abstract/PRC/v74/e044602 | last2 = Utyonkov | first2 = V. K. | last3 = Lobanov | first3 = Yu. V. | last4 = Abdullin | first4 = F. Sh. | last5 = Polyakov | first5 = A. N. | last6 = Sagaidak | first6 = R. N. | last7 = Shirokovsky | first7 = I. V. | last8 = Tsyganov | first8 = Yu. S. | last9 = Voinov | first9 = A. A. }}</ref>

|-

| 113

|[[Ununtrium]]

|2003

| [[Joint Institute for Nuclear Research]] in Dubna and [[Lawrence Livermore National Laboratory]]

|<ref name="113+115">{{cite journal | last = Oganessian | first = Yu. Ts. | year = 2005 | title = Synthesis of elements 115 and 113 in the reaction <sup>243</sup>Am + <sup>48</sup>Ca | journal = Physical Review C | volume = 72 | pages = 034611 | doi = 10.1103/PhysRevC.72.034611 | url = http://link.aps.org/abstract/PRC/v72/e034611 | last2 = Utyonkov | first2 = V. K. | last3 = Dmitriev | first3 = S. N. | last4 = Lobanov | first4 = Yu. V. | last5 = Itkis | first5 = M. G. | last6 = Polyakov | first6 = A. N. | last7 = Tsyganov | first7 = Yu. S. | last8 = Mezentsev | first8 = A. N. | last9 = Yeremin | first9 = A. V. }}</ref>

|-

| 115

|[[Ununpentium]]

|2003

| [[Joint Institute for Nuclear Research]] in Dubna and [[Lawrence Livermore National Laboratory]]

|<ref name="113+115" />

|-

| 122

|''[[Unbibium]]''

|''2008''

| [[Hebrew University of Jerusalem]]<ref>{{cite web|url=http://arxiv.org/abs/0804.3869 |title=[0804.3869&#93; Evidence for a long-lived superheavy nucleus with atomic mass number A=292 and atomic number Z=~122 in natural Th |publisher=Arxiv.org |date= |accessdate=2008-09-12}}</ref>

| '''Disputed claim:''' A group led by [[Amnon Marinov]] at the Hebrew University of Jerusalem claims to have found single atoms of unbibium in naturally occurring thorium deposits at a concentration of between 10<sup>−11</sup> and 10<sup>−12</sup>.<ref>{{cite web|url=http://arxivblog.com/?p=385 |title=the physics arXiv blog » Blog Archive » First superheavy element found in nature |publisher=Arxivblog.com |date= |accessdate=2008-09-12}}</ref> If this is accurate, unbibium would be the first naturally occurring element to be discovered in nature since [[Francium]].

|-

|}

==References==

{{reflist|3}}

==External links==

\*http://www.nndc.bnl.gov/content/elements.html

\*[http://www.ausetute.com.au/elemhist.html History of Elements of the Periodic Table]

\*[http://chemistry.about.com/library/weekly/aa030303a.htm Timeline of Element Discoveries]

{{PeriodicTablesFooter}}

{{DEFAULTSORT:Timeline Of Chemical Elements Discoveries}}

[[Category:History of chemistry]]

[[Category:History of physics]]

[[Category:Lists of chemical elements|Discovery]]

[[Category:Discoverers of chemical elements|\*]]

[[Category:Chemistry timelines|Elements, discoveries]]

[[af:Ontdekking van die chemiese elemente]]

[[ar:ترتيب زمني لاكتشاف العناصر الكيميائية]]

[[ca:Història dels elements químics]]

[[cy:Rhestr elfennau yn nhrefn eu darganfyddiad]]

[[fa:کشف عناصر شیمیایی]]

[[fr:Histoire de la découverte des éléments chimiques]]

[[hr:Otkriće kemijskih elemenata]]

[[id:Penemuan unsur kimia]]

[[it:Scoperta degli elementi chimici]]

[[ja:化学元素発見の年表]]

[[pl:Historia odkryć pierwiastków]]

[[pt:Descoberta dos elementos químicos]]

[[ru:Хронология открытия химических элементов]]