

# NAMES OF SCIENTISTS ASSOCIATED WITH DISCOVERIES OF ELEMENTS OF PERIODIC TABLE

© Dr. John Andraos 2002 - 2021

Department of Chemistry, York University  
4700 Keele Street, Toronto, ONTARIO M3J 1P3, CANADA

For suggestions, corrections, additional information, and comments please send e-mails to [jandraos@yorku.ca](mailto:jandraos@yorku.ca)

<http://www.chem.yorku.ca/NAMED/>

| Z, Element  | Symbol | Discoverer                     | Dates       | Nationality   | Place and Date of Discovery    |
|-------------|--------|--------------------------------|-------------|---|--------------------------------|
| 1. Hydrogen | H      | Cavendish, Henry               | 1731 - 1810 | British (b. Nice, France)                             | 1766<br>London, England        |
| 2. Helium   | He     | Janssen, Pierre<br>Jules Cesar | 1824 - 1907 | French<br>(b. Paris, France)                          | 1868                           |
|             |        | Ramsay, Sir<br>William         | 1852 - 1916 | Scottish<br>(b. Glasgow, Scotland)                    | 1895<br>London, England        |
| 3. Lithium  | Li     | Arfvedson, Johann August       | 1792 - 1841 | Swedish (b. Skagerholms-Bruk, Skaraborgs-Län, Sweden) | 1817/1818<br>Stockholm, Sweden |

|              |           |                             |             |   |  |
|--------------|-----------|-----------------------------|-------------|---|--|
| 4. Beryllium | <b>Be</b> | Vauquelin, Louis<br>Nicolas | 1763 - 1829 | French (b. Saint-André<br>d'Héberôt, Calvados,<br>France) | 1797<br>Paris, France                    |
| 5. Boron     | <b>B</b>  | Gay-Lussac,<br>Joseph Louis | 1778 - 1850 | French (b. St.<br>Léonard, Haute<br>Vienne, France)       | 1808<br>Paris, France<br>London, England |
|              |           | Thénard, Louis<br>Jacques   | 1777 - 1857 | French (b. Louptière,<br>France)                          |  |
|              |           | Davy, Sir<br>Humphry        | 1778 - 1829 | British<br>(b. Penzance, Cornwall,<br>England)            |  |
| 6. Carbon    | <b>C</b>  | N/A                         | N/A         | N/A   | pre-history                              |
| 7. Nitrogen  | <b>N</b>  | Rutherford,<br>Daniel       | 1749 - 1819 | Scottish<br>(b. Edinburgh, Scotland)                      | 1772<br>Edinburgh, Scotland              |
| 8. Oxygen    | <b>O</b>  | Priestley, Joseph           | 1733 - 1804 | British<br>(b. Fieldhead, near Leeds,<br>England)         | 1774<br>Leeds, England                   |
|              |           | Scheele, Carl<br>Wilhelm    | 1742 - 1786 | Swedish<br>(b. Stralsund, Pomerania,<br>now in Germany)   | Uppsala, Sweden                          |
| 9. Fluorine  | <b>F</b>  | Moissan, Henri              | 1852 - 1907 | French (b. Paris, France)                                 | 1886<br>Paris, France                    |

|                |           |  |                            |   |                             |
|----------------|-----------|--|----------------------------|---|-----------------------------|
| 10. Neon       | <b>Ne</b> | Ramsay, Sir William<br>Travers, Morris William | 1852 - 1916<br>1872 - 1961 | Scottish (b. Glasgow, Scotland)<br>British (b. Kensington, London, England) | 1898<br>London, England     |
| 11. Sodium     | <b>Na</b> | Davy, Sir Humphry                              | 1778 - 1829                | British (b. Penzance, Cornwall, England)                                    | 1807<br>London, England     |
| 12. Magnesium  | <b>Mg</b> | Black, Joseph                                  | 1728 - 1799                | Scottish (b. Bordeaux, France)  | 1755<br>Edinburgh, Scotland |
| 13. Aluminum   | <b>Al</b> | Öersted, Hans Christian                        | 1777 - 1851                | Danish (b. Rudkøbing, Denmark)  | 1825<br>Copenhagen, Denmark |
| 14. Silicon    | <b>Si</b> | Berzelius, Jöns Jakob                          | 1779 - 1848                | Swedish (b. Väversunda, Östergötland, Sweden)                               | 1824<br>Stockholm, Sweden   |
| 15. Phosphorus | <b>P</b>  | Brand, Hennig                                  | <i>fl.</i> 1670            | German (b. Hamburg, Germany)  | 1669<br>Hamburg, Germany    |
| 16. Sulfur     | <b>S</b>  | N/A  | N/A                        | N/A   | pre-history                 |
| 17. Chlorine   | <b>Cl</b> | Scheele, Carl Wilhelm                          | 1742 - 1786                | Swedish (b. Stralsund, Pomerania, now in Germany)                           | 1774<br>Uppsala, Sweden     |

|               |           |   |             |   |   |
|---------------|-----------|---|-------------|---|---|
| 18. Argon     | <b>Ar</b> | Rayleigh, Lord<br>John William<br>Strutt, 3rd Baron | 1842 - 1919 | British (b. near Maldon,<br>Essex, England)               | 1894<br>London, England<br>Bristol, England |
|               |           | Ramsay, Sir<br>William                              | 1852 - 1916 | Scottish<br>(b. Glasgow, Scotland)                        |   |
| 19. Potassium | <b>K</b>  | Davy, Sir<br>Humphry                                | 1778 - 1829 | British<br>(b. Penzance, Cornwall,<br>England)            | 1807<br>London, England                     |
| 20. Calcium   | <b>Ca</b> | Davy, Sir<br>Humphry                                | 1778 - 1829 | British<br>(b. Penzance, Cornwall,<br>England)            | 1808<br>London, England                     |
| 21. Scandium  | <b>Sc</b> | Nilson, Lars<br>Frederick                           | 1840 - 1899 | Swedish<br>(b. Östergötland, Sweden)                      | 1879<br>Uppsala, Sweden                     |
| 22. Titanium  | <b>Ti</b> | Gregor, Rev.<br>William                             | 1761 - 1817 | British (b. Trewarthenick,<br>Cornwall, England)          | 1791<br>Creed, Cornwall, England            |
|               |           | Klaproth, Martin<br>Heinrich                        | 1743 - 1817 | German (b. Wernigerode,<br>Germany)                       | 1795<br>Berlin, Germany                     |
| 23. Vanadium  | <b>V</b>  | del Rio, Andrés<br>Manuel                           | 1764 - 1849 | Spanish (b. Madrid, Spain)                                | 1801<br>Mexico City, Mexico                 |
| 24. Chromium  | <b>Cr</b> | Vauquelin, Louis<br>Nicolas                         | 1763 - 1829 | French (b. Saint-André<br>d'Héberôt, Calvados,<br>France) | 1797<br>Paris, France                       |

|               |           |  |             |  |                             |
|---------------|-----------|--|-------------|--|-----------------------------|
| 25. Manganese | <b>Mn</b> | Gahn, Johan<br>Gottlieb                          | 1745 - 1818 | Swedish (b. Voxna,<br>Gävleborg, Sweden)         | 1774<br>Stockholm, Sweden   |
| 26. Iron      | <b>Fe</b> | N/A  | N/A         | N/A  | c. 2500 BC                  |
| 27. Cobalt    | <b>Co</b> | Brandt, Georg                                    | 1694 - 1768 | Swedish (b. Riddarhytta,<br>Sweden)              | 1735<br>Stockholm, Sweden   |
| 28. Nickel    | <b>Ni</b> | Cronstedt, Axel<br>Frederik, Baron               | 1722 - 1765 | Swedish (b. Södermanland,<br>Sweden)             | 1751<br>Stockholm, Sweden   |
| 29. Copper    | <b>Cu</b> | N/A  | N/A         | N/A  | c. 5000 BC                  |
| 30. Zinc      | <b>Zn</b> | N/A  | N/A         | N/A  | pre 1500; 1374              |
| 31. Gallium   | <b>Ga</b> | de Boisbaudran,<br>Paul Émile Lecoq              | 1838 - 1912 | French (b. Cognac,<br>Charente, France)          | 1875<br>Paris, France       |
| 32. Germanium | <b>Ge</b> | Winkler, Clemens<br>Alexander                    | 1838 - 1904 | German<br>(b. Freiberg, Germany)                 | 1886<br>Freiberg, Germany   |
| 33. Arsenic   | <b>As</b> | Magnus, Albertus<br>St. (Count von<br>Bollstädt) | 1193 - 1280 | German (b. Lauingen,<br>Germany)                 | c. 1250<br>Germany          |
| 34. Selenium  | <b>Se</b> | Berzelius, Jöns<br>Jakob                         | 1779 - 1848 | Swedish (b. Väversunda,<br>Östergötland, Sweden) | 1817<br>Stockholm, Sweden   |
| 35. Bromine   | <b>Br</b> | Balard, Antoine<br>Jérôme                        | 1802 - 1876 | French (b. Montpellier,<br>Hérault, France)      | 1826<br>Montpellier, France |
|               |           | Löwig, Carl                                      | 1803 - 1890 | German<br>(b. Kreuznach, Germany)                | Heidelberg, Germany         |

|                |           |                           |             |  |                             |
|----------------|-----------|---------------------------|-------------|--|-----------------------------|
| 36. Krypton    | <b>Kr</b> | Ramsay, Sir William       | 1852 - 1916 | Scottish<br>(b. Glasgow, Scotland)                               | 1898<br>London, England     |
|                |           | Travers, Morris William   | 1872 - 1961 | British (b. Kensington,<br>London, England)                      |                             |
| 37. Rubidium   | <b>Rb</b> | Bunsen, Robert Wilhelm    | 1811 - 1899 | German<br>(b. Göttingen, Germany)                                | 1861<br>Heidelberg, Germany |
|                |           | Kirchhoff, Gustav Robert  | 1824 - 1887 | German<br>(b. Königsberg, Prussia<br>(now Kaliningrad, Russia))) |                             |
| 38. Strontium  | <b>Sr</b> | Hope, Thomas Charles      | 1766 - 1844 | Scottish<br>(b. Edinburgh, Scotland)                             | 1792<br>Strontian, Scotland |
|                |           | Crawford, Adair           | 1748 - 1795 | Scottish<br>(b. Antrim, Ireland)                                 | 1808<br>Edinburgh, Scotland |
| 39. Yttrium    | <b>Y</b>  | Gadolin, Johann           | 1760 - 1852 | Finnish (b. Åbo, Finland)  | 1794<br>Åbo, Finland        |
| 40. Zirconium  | <b>Zr</b> | Klaproth, Martin Heinrich | 1743 - 1817 | German (b. Wernigerode,<br>Germany)                              | 1789<br>Berlin, Germany     |
| 41. Niobium    | <b>Nb</b> | Hatchett, Charles         | 1765 - 1847 | British (b. London, England)                                     | 1801<br>London, England     |
| 42. Molybdenum | <b>Mo</b> | Hjelm, Peter Jacob        | 1746 - 1813 | Swedish<br>(b. Sunnerbo, Sweden)                                 | 1781<br>Uppsala, Sweden     |

|                |           |   |             |   |                                |
|----------------|-----------|---|-------------|---|--------------------------------|
| 43. Technetium | <b>Tc</b> | Noddack, Walter                                 | 1893 - 1960 | German<br>(b. Bamberg, Germany)                   | 1925<br>Berlin, Germany        |
|                |           | Perrier, Carlo                                  | 1886 - 1948 | Italian (b. ?)                                    |                                |
|                |           | Segré, Emilio<br>Gino                           | 1905 - 1989 | Italian-American (b. Tivoli,<br>near Rome, Italy) | 1937<br>Palermo, Sicily, Italy |
| 44. Ruthenium  | <b>Ru</b> | Sniadecki,<br>Jedrzej Andrzej                   | 1768 - 1838 | Polish (b. ?)                                     | 1808<br>Vilno, Poland          |
|                |           | Osann, Gottfried<br>Wilhelm                     | 1797 - 1866 | German (b. Weimar,<br>Germany)                    | 1828                           |
|                |           | Claus, Carl Ernst<br>(Klaus, Karl<br>Karlovich) | 1796 - 1864 | Estonian (b. Dorpat (Tartu))                      | 1844                           |
| 45. Rhodium    | <b>Rh</b> | Wollaston,<br>William Hyde                      | 1766- 1828  | British (b. East Dereham,<br>Norfolk, England)    | 1803<br>London, England        |
| 46. Palladium  | <b>Pd</b> | Wollaston,<br>William Hyde                      | 1766- 1828  | British (b. East Dereham,<br>Norfolk, England)    | 1803<br>London, England        |
| 47. Silver     | <b>Ag</b> | N/A   | N/A         | N/A   | c. 3000 BC                     |

|               |           |  |             |   |                           |
|---------------|-----------|--|-------------|---|---------------------------|
| 48. Cadmium   | <b>Cd</b> | Stromeyer,<br>Friedrich                            | 1776 - 1835 | German<br>(b. Göttingen, Germany)                 | 1817                      |
|               |           | Davy, Sir<br>Humphry                               | 1778 - 1829 | British<br>(b. Penzance, Cornwall,<br>England)    | 1817<br>London, England   |
| 49. Indium    | <b>In</b> | Reich, Ferdinand                                   | 1799 - 1882 | German (b. Bernburg,<br>Germany)                  | 1863<br>Freiberg, Germany |
|               |           | Richter,<br>Hieronymous<br>Theodor                 | 1824 - 1898 | German (b. Dresden,<br>Germany)                   |                           |
| 50. Tin       | <b>Sn</b> | N/A  | N/A         | N/A   | c. 2100 BC                |
| 51. Antimony  | <b>Sb</b> | N/A  | N/A         | N/A   | c. 1600 BC                |
| 52. Tellurium | <b>Te</b> | Müller, Franz<br>Joseph, Baron<br>von Reichenstein | 1740 - 1825 | Austrian (b. Nagyszeben,<br>Austria, now Rumania) | 1782/3<br>Sibiu, Romania  |
| 53. Iodine    | <b>I</b>  | Courtois, Bernard                                  | 1777 - 1838 | French (b. Dijon, France)                         | 1811<br>Paris, France     |
| 54. Xenon     | <b>Xe</b> | Ramsay, Sir<br>William                             | 1852 - 1916 | Scottish<br>(b. Glasgow, Scotland)                | 1898<br>London, England   |
|               |           | Travers, Morris<br>William                         | 1872 - 1961 | British (b. Kensington,<br>London, England)       |                           |



|                     |           |   |             |  |                             |
|---------------------|-----------|---|-------------|--|-----------------------------|
| 55. Cesium          | <b>Cs</b> | Bunsen, Robert<br>Wilhelm               | 1811 - 1899 | German<br>(b. Göttingen, Germany)                                | 1860<br>Heidelberg, Germany |
|                     |           | Kirchhoff, Gustav<br>Robert             | 1824 - 1887 | German<br>(b. Königsberg, Prussia<br>(now Kaliningrad, Russia))) |                             |
| 56. Barium          | <b>Ba</b> | Davy, Sir<br>Humphry                    | 1778 - 1829 | British<br>(b. Penzance, Cornwall,<br>England)                   | 1808<br>London, England     |
| 57. Lanthanum       | <b>La</b> | Mosander, Carl<br>Gustav                | 1797 - 1858 | Swedish (b. Kalmar,<br>Sweden)                                   | 1839<br>Stockholm, Sweden   |
| 58. Cerium          | <b>Ce</b> | Berzelius, Jöns<br>Jakob                | 1779 - 1848 | Swedish (b. Väversunda,<br>Östergötland, Sweden)                 | 1803<br>Västmanland, Sweden |
|                     |           | Hisinger, Wilhelm                       | 1766 - 1852 | Swedish (b.<br>Skinnskatteberg,<br>Västmanland, Sweden)          |                             |
| 59.<br>Praseodymium | <b>Pr</b> | Auer, Karl,<br>Freiherr von<br>Welsbach | 1858 - 1929 | Austrian (b. Vienna, Austria)                                    | 1885<br>Vienna, Austria     |

|                |           |   |             |                                       |                             |
|----------------|-----------|---|-------------|---------------------------------------|-----------------------------|
| 60. Neodymium  | <b>Nd</b> | Mosander, Carl                          | 1797 - 1858 | Swedish (b. Kalmar, Sweden)           | 1841<br>Stockholm, Sweden   |
|                |           | Auer, Karl,<br>Freiherr von<br>Welsbach | 1858 - 1929 | Austrian (b. Vienna, Austria)         | 1885<br>Vienna, Austria     |
| 61. Promethium | <b>Pm</b> | Marinsky, Jacob<br>Akiba                | 1918 - 2005 | American (b. Buffalo, New York, USA)  | 1945<br>Oak Ridge, USA      |
|                |           | Glendenin,<br>Lawrence Elgin            | 1918 - 2008 | American (b. Bay City, Michigan, USA) |                             |
|                |           | Coryell, Charles<br>DuBois              | 1912 - 1971 |                                       |                             |
| 62. Samarium   | <b>Sm</b> | Delafontaine,<br>Marc                   | 1837 – 1911 | Swiss (b. Céligny, Switzerland)       | 1878                        |
|                |           | de Boisbaudran,<br>Paul Émile Lecoq     | 1838 - 1912 | French (b. Cognac, Charente, France)  | 1879<br>Paris, France       |
| 63. Europium   | <b>Eu</b> | Demarçay,<br>Eugène Anatole             | 1852 - 1904 | French (b. Paris, France)             | 1896, 1901<br>Paris, France |

|                |           |   |             |   |                             |
|----------------|-----------|---|-------------|---|-----------------------------|
| 64. Gadolinium | <b>Gd</b> | de Marignac,<br>Jean Charles<br>Galissard | 1817 – 1894 | Swiss (b. Geneva,<br>Switzerland)       | 1886<br>Geneva, Switzerland |
|                |           | de Boisbaudran,<br>Paul Émile Lecoq       | 1838 - 1912 | French (b. Cognac,<br>Charente, France) | 1886<br>Paris, France       |
| 65. Terbium    | <b>Tb</b> | Mosander, Carl<br>Gustav                  | 1797 - 1858 | Swedish (b. Kalmar,<br>Sweden)          | 1843<br>Stockholm, Sweden   |
| 66. Dysprosium | <b>Dy</b> | Delafontaine,<br>Marc                     | 1837 – 1911 | Swiss (b. Céligny,<br>Switzerland)      | 1878                        |
|                |           | de Boisbaudran,<br>Paul Émile Lecoq       | 1838 - 1912 | French (b. Cognac,<br>Charente, France) | 1886<br>Paris, France       |
| 67. Holmium    | <b>Ho</b> | Cleve, Per<br>Teodor                      | 1840 - 1905 | Swedish<br>(b. Stockholm, Sweden)       | 1878<br>Uppsala, Sweden     |
|                |           | Delafontaine,<br>Marc                     | 1837 – 1911 | Swiss (b. Céligny,<br>Switzerland)      |                             |
|                |           | Soret, Jacques<br>Louis                   | 1827 - 1890 | Swiss (b. Geneva,<br>Switzerland)       | Geneva, Switzerland         |
| 68. Erbium     | <b>Er</b> | Mosander, Carl<br>Gustav                  | 1797 - 1858 | Swedish (b. Kalmar,<br>Sweden)          | 1842/3<br>Stockholm, Sweden |
| 69. Thulium    | <b>Tm</b> | Cleve, Per<br>Teodor                      | 1840 - 1905 | Swedish<br>(b. Stockholm, Sweden)       | 1879<br>Uppsala, Sweden     |

|               |           |   |   |   |  |
|---------------|-----------|---|---|---|--|
| 70. Ytterbium | <b>Yb</b> | de Marignac,<br>Jean Charles<br>Galissard                             | 1817 - 1894                                       | Swiss (b. Geneva,<br>Switzerland)   | 1878<br>Geneva, Switzerland                              |
| 71. Lutetium  | <b>Lu</b> | Urbain, Georges<br><br>James, C.                                      | 1872 - 1938                                       | French (b. Paris, France)   | 1907<br>Paris, France<br>New Hampshire, USA              |
| 72. Hafnium   | <b>Hf</b> | Urbain, Georges<br><br>Coster, Dirk<br><br>Hevesy, György<br>Karl von | 1872 - 1938<br><br>1889 - 1950<br><br>1885 - 1966 | French (b. Paris, France)<br><br>Dutch<br>(b. Amsterdam,<br>Netherlands)<br><br>Hungarian-Swedish<br>(b. Budapest, Hungary) | 1911<br>Paris, France<br><br>1923<br>Copenhagen, Denmark |
| 73. Tantalum  | <b>Ta</b> | Ekeberg, Anders<br>Gustaf   | 1767 - 1813                                       | Swedish<br>(b. Stockholm, Sweden)   | 1802<br>Uppsala, Sweden                                  |
| 74. Tungsten  | <b>W</b>  | D'Elhuyar, Don<br>Juan José<br>D'Elhuyar, Don<br>Fausto               | 1755 - 1833                                       | Spanish (b. Logroño, Spain)   | 1783<br>Vergara, Spain                                   |

|              |           |                                   |             |                                    |                         |
|--------------|-----------|-----------------------------------|-------------|------------------------------------|-------------------------|
| 75. Rhenium  | <b>Re</b> | Noddack, Walter<br>Karl Friedrich | 1893 - 1960 | German<br>(b. Bamberg, Germany)    | 1925<br>Berlin, Germany |
|              |           | Noddack, Ida<br>Eva Tacke         | 1896 - 1978 | German<br>(b. Lackhausen, Germany) |                         |
|              |           | Berg, Otto                        | 1874 - 1939 | German (b. ?)                      |                         |
| 76. Osmium   | <b>Os</b> | Tennant,<br>Smithson              | 1761 - 1815 | British (b. Selby, England)        | 1803<br>London, England |
| 77. Iridium  | <b>Ir</b> | Tennant,<br>Smithson              | 1761 - 1815 | British (b. Selby, England)        | 1803<br>London, England |
| 78. Platinum | <b>Pt</b> | N/A                               | N/A         | N/A                                | pre 1700                |
| 79. Gold     | <b>Au</b> | N/A                               | N/A         | N/A                                | c. 3000 BC              |
| 80. Mercury  | <b>Hg</b> | N/A                               | N/A         | N/A                                | c. 1500 BC              |
| 81. Thallium | <b>Tl</b> | Crookes, Sir<br>William           | 1832 - 1919 | British (b. London, England)       | 1861<br>London, England |
| 82. Lead     | <b>Pb</b> | N/A                               | N/A         | N/A                                | c. 1000 BC              |
| 83. Bismuth  | <b>Bi</b> | N/A                               | N/A         | N/A                                | c. 1500                 |
| 84. Polonium | <b>Po</b> | Curie, Marie                      | 1867 - 1934 | French (b. Warsaw, Poland)         | 1898<br>Paris, France   |

|              |           |  |   |   |                                   |
|--------------|-----------|--|---|---|-----------------------------------|
| 85. Astatine | <b>At</b> | Corson, Dale<br>Raymond<br><br>Mackenzie,<br>Kenneth Ross<br><br>Segrè, Emilio<br>Gino | 1914 -<br><br>1912 – 2002*<br><br>1905 - 1989 | American (b.<br>Pittsburg, Kansas,<br>USA)<br><br>American (b. Portland,<br>Oregon, USA)<br><br>Italian-American (b. Tivoli,<br>near Rome, Italy) | 1940<br>Berkeley, California, USA |
| 86. Radon    | <b>Rn</b> | Dorn, Friedrich<br>Ernst   | 1848 - 1916                                   | German<br>(b. Guttstadt, Germany)   | 1900<br>Halle, Germany            |
| 87. Francium | <b>Fr</b> | Perey,<br>Marguerite<br>Catherine  | 1909 - 1975                                   | French<br>(b. Villemomble, France)  | 1939<br>Paris, France             |
| 88. Radium   | <b>Ra</b> | Curie, Marie<br>(Manya née<br>Skłodowska)<br>Curie, Pierre                             | 1867 - 1934<br><br>1859 - 1906                | French (b. Warsaw, Poland)<br><br>French (b. Paris, France)   | 1898<br>Paris, France             |
| 89. Actinium | <b>Ac</b> | Debièrne, André<br>Louis   | 1874 - 1949                                   | French (b. Paris, France)   | 1899<br>Paris, France             |
| 90. Thorium  | <b>Th</b> | Berzelius, Jöns<br>Jakob   | 1779 - 1848                                   | Swedish (b. Väversunda,<br>Östergötland, Sweden)  | 1815, 1828<br>Stockholm, Sweden   |

|                  |           |                                |              |   |                                   |
|------------------|-----------|--------------------------------|--------------|---|-----------------------------------|
| 91. Protactinium | <b>Pa</b> | Hahn, Otto                     | 1879 - 1968  | German<br>(b. Frankfurt, Germany)               | 1917<br>Berlin, Germany           |
|                  |           | Meitner, Lise                  | 1878 - 1968  | Austrian-Swedish (b.<br>Vienna, Austria)        |                                   |
|                  |           | Soddy, Frederick               | 1877 - 1956  | British<br>(b. Eastbourne, England)             |                                   |
|                  |           | Cranston, John<br>A.           | 1925 - 1980  | British (b. England)                            |                                   |
|                  |           | Fleck, Sir<br>Alexander, Baron | 1889 - 1968  | Scottish<br>(b. Glasgow, Scotland)              |                                   |
|                  |           | Fajans, Kasimir                | 1887 - 1975  | Polish (b. Warsaw, Poland)                      |                                   |
|                  |           | Göhring, Otto H.               |              |   |                                   |
| 92. Uranium      | <b>U</b>  | Klaproth, Martin<br>Heinrich   | 1743 - 1817  | German (b. Wernigerode,<br>Germany)             | 1789<br>Berlin, Germany           |
| 93. Neptunium    | <b>Np</b> | McMillan, Edwin<br>M.          | 1907 - 1991  | American (b. Redondo<br>Beach, California, USA) | 1940<br>Berkeley, California, USA |
|                  |           | Abelson, Philip<br>Hauge       | 1913 - 2002* | American (b. Tacoma,<br>Washington, USA)        |                                   |

|               |           |  |  |   |                                   |
|---------------|-----------|--|--|---|-----------------------------------|
| 94. Plutonium | <b>Pu</b> | Seaborg, Glenn T.<br>Wahl, Arthur Charles<br>Kennedy, J.W.                             | 1912 - 1999<br>1917 -<br>?                     | American (b. Ishpeming, Michigan, USA)<br>American (b. Des Moines, Iowa, USA)   | 1940<br>Berkeley, California, USA |
| 95. Americium | <b>Am</b> | Seaborg, Glenn T.<br>James, Ralph<br>Arthur<br>Morgan, Leon<br>Owen<br>Ghiorso, Albert | 1912 - 1999<br>1920 -<br>1919 -<br>1915 - 2010 | American (b. Ishpeming, Michigan, USA)<br>American (b. Salt Lake City, Utah, USA)<br>American (b. Oklahoma City, Oklahoma, USA)<br>American (b. Vallejo, California, USA) | 1944<br>Chicago, Illinois, USA    |
| 96. Curium    | <b>Cm</b> | Seaborg, Glenn T.<br>James, R.A.<br>Ghiorso, Albert                                    | 1912 - 1999<br>1915 - 2010                     | American (b. Ishpeming, Michigan, USA)<br><br>American (b. Vallejo, California, USA)  | 1944<br>Berkeley, California, USA |
| 97. Berkelium | <b>Bk</b> | Thompson, S.G.<br>Seaborg, Glenn T.<br>Ghiorso, Albert                                 | 1912 - 1976<br>1912 - 1999<br>1915 - 2010      | American (b. Ishpeming, Michigan, USA)<br>American (b. Vallejo, California, USA)  | 1949<br>Berkeley, California, USA |



|                 |           |   |  |  |                                   |
|-----------------|-----------|---|--|--|-----------------------------------|
| 98. Californium | <b>Cf</b> | Thompson, S.G.<br>Seaborg, Glenn<br>T.<br>Ghiorso, Albert<br><br>Street, Jr.,<br>Kenneth                  | 1912 - 1976<br>1912 - 1999<br><br>1915 - 2010                        | American<br>American (b. Ishpeming,<br>Michigan, USA)<br>American (b. Vallejo,<br>California, USA)                                   | 1950<br>Berkeley, California, USA |
| 99. Einsteinium | <b>Es</b> | Choppin,<br>Gregory Robert<br>Thompson,<br>Stanley Gerald<br>Harvey, Bernard<br>George<br>Ghiorso, Albert | 1927 - 2015<br><br>1912 - 1976<br><br>1919 - 2016<br><br>1915 - 2010 | American (b. Eagle Lake,<br>Texas, USA)<br>American<br>British-American (b.<br>England)<br>American (b. Vallejo,<br>California, USA) | 1952<br>Berkeley, California, USA |
| 100. Fermium    | <b>Fm</b> | Choppin,<br>Gregory Robert<br>Thompson, S.G.<br>Harvey, B.G.<br><br>Ghiorso, Albert                       | 1927 - 2015<br><br>1912 - 1976<br>1919 - 2016<br><br>1915 - 2010     | American (b. Eagle Lake,<br>Texas, USA)<br>American<br>British-American (b.<br>England)<br>American (b. Vallejo,<br>California, USA) | 1952<br>Berkeley, California, USA |

|                     |           |   |  |  |                                   |
|---------------------|-----------|---|--|--|-----------------------------------|
| 101.<br>Mendelevium | <b>Md</b> | Choppin,<br>Gregory Robert<br><br>Thompson, S.G.<br>Harvey, B.G.<br>Ghiorso, Albert<br><br>Seaborg, Glenn<br>T. | 1927 - 2015<br><br>1912 - 1976<br><br>1915 - 2010<br><br>1912 - 1999 | American (b. Eagle Lake,<br>Texas, USA)<br><br>American<br><br>British (b. England)<br>American (b. Vallejo,<br>California, USA)<br>American (b. Ishpeming,<br>Michigan, USA)  | 1955<br>Berkeley, California, USA |
| 102. Nobelium       | <b>No</b> | Sikkeland,<br>Torbjorn<br>Walton, John<br>Richard<br>Ghiorso, Albert<br><br>Seaborg, Glenn<br>T.                | 1923 - 2014<br><br>1923 -<br><br>1915 - 2010<br><br>1912 - 1999      | Norwegian (b. Varteig,<br>Norway)<br>American (b. Chicago<br>Heights, Illinois, USA)<br>American (b. Vallejo,<br>California, USA)<br>American (b. Ishpeming,<br>Michigan, USA) | 1958<br>Berkeley, California, USA |
| 103. Lawrencium     | <b>Lr</b> | Larsh, Almon E.<br>Sikkeland,<br>Torbjorn<br><br>Ghiorso, Albert<br><br>Latimer, Robert<br>M.                   | 1929 -<br><br>1923- 2014<br><br>1915 - 2010<br><br>1934 -1998        | American (b. California,<br>USA)<br><br>Norwegian (b. Varteig,<br>Norway)<br><br>American (b. Vallejo,<br>California, USA)<br>American (b. California,<br>USA)                 | 1961<br>Berkeley, California, USA |

|                       |           |  |             |   |  |
|-----------------------|-----------|--|-------------|---|--|
| 104.<br>Rutherfordium | <b>Rf</b> | Flerov, G.N.<br>Zvara, I.I.<br>Ghiorso, Albert       | 1915 - 2010 | Russian<br>Russian<br>American (b. Vallejo,<br>California, USA) | 1964<br>Dubna, Russia<br>Berkeley, California, USA |
| 105. Dubnium          | <b>Db</b> | Flerov, G.N.<br>Ghiorso, Albert                      | 1915 - 2010 | Russian<br>American (b. Vallejo,<br>California, USA)            | 1967<br>Dubna, Russia<br>Berkeley, California, USA |
| 106. Seaborgium       | <b>Sg</b> | Ghiorso, Albert                                      | 1915 - 2010 | American (b. Vallejo,<br>California, USA)                       | 1974<br>Berkeley, California, USA                  |
| 107. Bohrium          | <b>Bh</b> | Armbruster,<br>Peter<br><br>Münzenberg,<br>Gottfried | 1935 -      | German, b. Dachau,<br>Germany                                   | 1981<br>Darmstadt, Germany                         |
| 108. Hassium          | <b>Hs</b> | Armbruster,<br>Peter<br><br>Münzenberg,<br>Gottfried | 1935 -      | German, b. Dachau,<br>Germany                                   | 1984<br>Darmstadt, Germany                         |
| 109. Meitnerium       | <b>Mt</b> | Armbruster,<br>Peter<br><br>Münzenberg,<br>Gottfried | 1935 -      | German, b. Dachau,<br>Germany                                   | 1982<br>Darmstadt, Germany                         |

|                                   |                |                                     |        |                               |                            |
|-----------------------------------|----------------|-------------------------------------|--------|-------------------------------|----------------------------|
| 110. Ununnilium<br>(Darmstadtium) | <b>Uun, Dm</b> | Armbruster,<br>Peter<br>Hofmann, S. | 1935 - | German, b. Dachau,<br>Germany | 1994<br>Darmstadt, Germany |
| 111. Ununonium<br>(Roentgenium)   | <b>Uuu</b>     | Armbruster,<br>Peter<br>Hofmann, S. | 1935 - | German, b. Dachau,<br>Germany | 1994<br>Darmstadt, Germany |
| 112. Ununbium                     | <b>Uub</b>     | Armbruster,<br>Peter<br>Hofmann, S. | 1935 - | German, b. Dachau,<br>Germany | 1996<br>Darmstadt, Germany |

\*Personal communication from Dr. Joel S. Leventhal, Emeritus Scientist, U.S. Geological Survey, November 28, 2005.

| <b>DISCOVERERS OF ELEMENTS IN PERIODIC TABLE</b> |                                    |                   |                            |
|--|------------------------------------|-------------------|----------------------------|
| <b>University</b>                                | <b>Scientists</b>                  | <b>Degree</b>     | <b>Elements Discovered</b> |
| Berlin   | Meitner, Lise                      | 1922              | Pa                         |
| Berlin   | Noddack, Walter Karl Friedrich     | 1921              | Re                         |
| Berlin/<br>Heidelberg                            | Löwig, Carl Jacob                  | 1830?             | Br                         |
| Cal Tech   | Coryell, Charles Dubois            | 1935              | Pm                         |
| Cambridge  | Cavendish, Henry                   | 1753<br>(no deg.) | H                          |
| Cambridge  | Gregor, Rev. William               | 1780's            | Ti                         |
| Cambridge  | Rayleigh, Lord John William Strutt | 1865              | Ar                         |
| Cambridge  | Tennant, Smithson                  | 1796 (MD)         | Os, Ir                     |
| Cambridge  | Wollaston, William Hyde            | 1787 (MD)         | Rh, Pd                     |
| Colegio de<br>San Isidro                         | del Rio, Andrés Manuel             | 1781              | V                          |
| Copenhagen                                       | Örsted, Hans Christian             | 1799              | Al                         |
| Dorpat   | Claus, Carl Ernst                  | 1839              | Ru                         |

|                           |                                     |                     |                      |
|---------------------------|-------------------------------------|---------------------|----------------------|
| (Tartu)                   | (Klaus, Karl Karlovich)             |                     |                      |
| Ecole Polytech.           | Balard, Antoine Jérôme              | 1826(pharm)         | Br                   |
| Ecole Polytech.           | Courtois, Bernard                   | 1801                | I                    |
| Ecole Polytech.           | Gay-Lussac, Joseph Louis            | 1800                | B                    |
| Ecole Polytech.           | Demarçay, Eugène Anatole            | 1880 (hon.)         | Eu                   |
| Ecole Polytech.           | Thénard, Louis Jacques              | 1790's<br>(no deg.) | B                    |
| Ecole Polytech./<br>Mines | de Marignac, Jean Charles Galissard | 1830's              | Gd, Yb               |
| Edinburgh                 | Black, Joseph                       | 1754                | Mg                   |
| Edinburgh                 | Priestley, Joseph                   | 1767                | O                    |
| Edinburgh                 | Rutherford, Daniel                  | 1772 (MD)           | N                    |
| England                   | Davy, Sir Humphry                   | no deg.             | B, Na, K, Ca, Cd, Ba |
| England                   | Hatchett, Charles                   | no deg.             | Nb                   |
| Freiberg                  | D'Elhuyar, Don Fausto               | 1770s               | W                    |
| Freiberg                  | D'Elhuyar, Don Juan José            | 1770s               | W                    |
| Freiberg                  | Richter, Hieronymous Theodor        | 1850s               | In                   |
| Freiberg                  | Winkler, Clemens Alexander          | 1860's              | Ge                   |
| Freiburg                  | Hevesy, György Karl von             | 1908                | Hf                   |
| Geneva                    | Soret, Jaques Louis                 | 1850s<br>(no deg.)  | Ho                   |
| Germany                   | Brand, Hennig                       | no deg.             | P                    |
| Germany                   | Klaproth, Martin Heinrich           | no deg.             | U, Ti, Zr            |
| Glasgow                   | Cranston, John Arnold               | 1921                | Pa                   |
| Glasgow                   | Crawford, Adair                     | 1780 (MD)           | Sr                   |
| Glasgow                   | Fleck, Sir Alexander                | 1916                | Pa                   |
| Goettingen                | Bunsen, Robert Wilhelm              | 1833                | Rb, Cs               |

|                    |                                       |                    |            |
|--------------------|---------------------------------------|--------------------|------------|
| Goettingen         | Reich, Ferdinand                      | 1819+              | In         |
| Heidelberg         | Auer, Karl, Freiherr von Welsbach     | 1882               | Pr, Nd     |
| Heidelberg         | Fajans, Kasimir                       | 1909               | Pa         |
| Koenigsberg        | Dorn, Friedrich Ernst                 | 1871               | Rn         |
| Koenigsberg        | Kirchhoff, Gustav Robert              | 1847               | Rb, Cs     |
| Leiden             | Coster, Dirk                          | 1922               | Hf         |
| Marburg            | Hahn, Otto                            | 1901               | Pa         |
| MIT                | Glendenin, Lawrence Elgin             | 1949               | Pm         |
| MIT                | Marinsky, Jacob A.                    | 1949               | Pm         |
| Oxford             | Harvey, Bernard George                | 1958               | Es, Fm, Md |
| Oxford             | Soddy, Frederick                      | 1898 (BSc)         | Pa         |
| Padua              | Magnus, Albertus St.                  | 1220s              | As         |
| Paris              | de Boisbaudran, Paul Émile Lecoq      | no deg.            | Ga, Sm, Dy |
| Paris              | Moissan, Ferdinand Frederic Henri     | 1880               | F          |
| Paris              | Perey, Marguerite Catherine           | 1929 (Dipl.)       | Fr         |
| Paris              | Urbain, Georges                       | 1899               | Lu         |
| Paris              | Vauquelin, Louis Nicolas              | 1780's             | Be, Cr     |
| Pavia              | Sniadecki, Jędrzej Andrzej            | 1793 (MD)          | Ru         |
| Princeton          | McMillan, Edwin Mattison              | 1932               | Np         |
| Purdue             | Walton, John Richard                  | 1957               | No         |
| Rheims             | Brandt, Georg                         | 1726 (MD)          | Co         |
| Rome               | Segré, Emilio Gino                    | 1928               | Tc, At     |
| Roy.Coll.<br>Chem. | Crookes, Sir William                  | 1854               | Th         |
| Sorbonne           | Curie, Marie (Manya née Sklodowska)   | 1902               | Po, Ra     |
| Sorbonne           | Curie, Pierre                         | 1895               | Ra         |
| Sorbonne           | Debierne, André Louis                 |                    | Ac         |
| Stockholm          | Arfvedson, Johann August              | 1800s<br>(no deg.) | Li         |
| Stockholm          | Hisinger, Wilhelm, Baron von          | no deg.            | Ce         |
| Texas              | <b>Choppin, Gregory Robert</b>        | 1953               | Es, Fm, Md |
| Transylvania       | Müller, Franz Joseph von Reichenstein | no deg.            | Te         |

|                   |                                 |                   |   |
|-------------------|---------------------------------|-------------------|---|
| TU Berlin         | Noddack, Ida Eva Tacke          | 1920              | Re  |
| TU Munich         | Armbruster, Peter               | 1961              | Bh, Hs, Mt, Uun, Uuu,<br>Uub              |
| Tuebingen         | Ramsay, Sir William             | 1873              | He, Ne, Ar, Kr, Xe                        |
| UC Berkeley       | Corson, Dale Raymond            | 1938              | At  |
| UC Berkeley       | Ghiorso, Albert                 | 1937(BSc)         | Am, Cm, Bk, Cf, Es, Fm,<br>Md, No, Lr, Sg |
| UC Berkeley       | James, Ralph Arthur             | 1948              | Cm  |
| UC Berkeley       | Kennedy, Joseph William         | 1939              | Pu  |
| UC Berkeley       | Mackenzie, Kenneth Ross         | 1940              | At  |
| UC Berkeley       | Morgan, Leon Owen               | 1947              | Am  |
| UC Berkeley       | Seaborg, Glenn T.               | 1937              | Am, Cm, Bk, Cf, Md, No,<br>Pu             |
| UC Berkeley       | Street, Jr., Kenneth            | 1949              | Cf  |
| UC Berkeley       | Thompson, Stanley Gerald        | 1948              | Bk, Cf, Es, Fm, Md                        |
| UC Berkeley       | Wahl, Arthur Charles            | 1942              | Pu  |
| UC Berkeley       | Abelson, Philip Hauge           | 1939              | Np  |
| UC London         | Travers, Morris William         | 1893 (BSc)        | Xe, Ne, Kr                                |
| Uppsala           | Berzelius, Jöns Jakob           | 1802 (MD)         | Si, Se, Ce, Th                            |
| Uppsala           | Cleve, Per Theodor              | 1863              | Ho, Tm                                    |
| Uppsala/<br>Mines | Cronstedt, Axel Frederik, Baron | 1748(no<br>Ph.D.) | Ni  |
| Uppsala           | Ekeberg, Anders Gustaf          | 1788              | Ta  |
| Uppsala           | Gadolin, Johann                 | 1780's            | Y   |
| Uppsala           | Gahn, Johan Gottlieb            | 1770              | Mn  |
| Uppsala           | Hjelm, Peter Jacob              | 1770's            | Mo  |
| Uppsala           | Mosander, Carl Gustav           | 1825 (MD)         | La, Er, Tb                                |
| Uppsala           | Nilson, Lars Frederick          | 1866              | Sc  |
| Uppsala           | Scheele, Carl Wilhelm           | 1770s             | O, Cl                                     |
|                   | Berg, Otto                      |                   | Re  |
|                   | Delafontaine, Marc              |                   | Ho  |
|                   | Flerov, G.N.                    |                   | Db, Rf                                    |

|  |                       |  |                  |
|--|-----------------------|--|------------------|
|  | Göhring, Otto H.      |  | Pa               |
|  | Hofmann, S.           |  | Dm, Z = 111, 112 |
|  | James, C.             |  | Lu               |
|  | Larsh, Almon E.       |  | Lr               |
|  | Latimer, Robert M.    |  | Lr               |
|  | Münzenberg, Gottfried |  | Bh, Hs, Mt       |
|  | Perrier, Carlo        |  | Tc               |
|  | Sikkeland, Torbjorn   |  | No, Lr           |
|  | Zvara, I.I.           |  | Rf               |

## PERIODIC TABLE OF THE ELEMENTS

|    |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|----|-----|-----|-----|----|----|----|----|----|----|
| H  |    |    |    |    |    |    |    |    |     |     |     |    |    |    |    |    | He |
| Li | Be |    |    |    |    |    |    |    |     |     |     | B  | C  | N  | O  | F  | Ne |
| Na | Mg |    |    |    |    |    |    |    |     |     |     | Al | Si | P  | S  | Cl | Ar |
| K  | Ca | Sc | Ti | V  | Cr | Mn | Fe | Co | Ni  | Cu  | Zn  | Ga | Ge | As | Se | Br | Kr |
| Rb | Sr | Y  | Zr | Nb | Mo | Tc | Ru | Rh | Pd  | Ag  | Cd  | In | Sn | Sb | Te | I  | Xe |
| Cs | Ba | La | Hf | Ta | W  | Re | Os | Ir | Pt  | Au  | Hg  | Tl | Pb | Bi | Po | At | Rn |
| Fr | Ra | Ac | Rf | Db | Sg | Bh | Hs | Mt | Uun | Uuu | Uub |    |    |    |    |    |    |

|    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Ce | Pr | Nd | Pm | Sm | Eu | Gd | Tb | Dy | Ho | Er | Tm | Yb | Lu |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|



|    |    |   |    |    |    |    |    |    |    |    |    |    |    |
|----|----|---|----|----|----|----|----|----|----|----|----|----|----|
| Th | Pa | U | Np | Pu | Am | Cm | Bk | Cf | Es | Fm | Md | No | Lr |
|----|----|---|----|----|----|----|----|----|----|----|----|----|----|

## PERIODIC TABLE OF THE ELEMENTS (BY COUNTRY OF DISCOVERY)

|  |  |  |  |  |  |  |    |  |    |    |    |  |    |    |   |  |  |  |
|--|--|--|--|--|--|--|----|--|----|----|----|--|----|----|---|--|--|--|
|  |  |  |  |  |  |  |    |  |    |    |    |  |    |    |   |  |  |  |
|  |  |  |  |  |  |  |    |  |    |    |    |  | C  |    |   |  |  |  |
|  |  |  |  |  |  |  |    |  |    |    |    |  |    |    | S |  |  |  |
|  |  |  |  |  |  |  | Fe |  |    | Cu | Zn |  |    |    |   |  |  |  |
|  |  |  |  |  |  |  |    |  |    | Ag |    |  | Sn | Sb |   |  |  |  |
|  |  |  |  |  |  |  |    |  | Pt | Au | Hg |  | Pb | Bi |   |  |  |  |
|  |  |  |  |  |  |  |    |  |    |    |    |  |    |    |   |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
|--|--|--|--|--|--|--|--|--|--|--|--|--|
|  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |

### References:

Emsley, John, *The Elements*, 3rd. ed., Clarendon Press: Oxford, 1998.

Bohlke, J.K.; De Bievre, P.; Hidika, H.; Pieser, H.S.; Rosman, K.J.R.; Taylor, P.D.P. *Pure Appl. Chem.* **2003**, 75, 683 – 800, "Atomic weights of the elements: review 2000".

Magnusson, Magnus (ed.), *Cambridge Biographical Dictionary*, Cambridge University Press: Cambridge, UK, 1990.

### TIMELINE OF DISCOVERY OF ELEMENTS OF PERIODIC TABLE (ARRANGED BY YEAR OF DISCOVERY)

| Year Discovered | Element Name | Element Symbol | Atomic Number, Z | Discoverers    |
|-----------------|--------------|----------------|------------------|----------------|
| ANTIQUITY       | Carbon       | C              | 6                | ANTIQUITY      |
| ANTIQUITY       | Sulfur       | S              | 16               | ANTIQUITY      |
| -5000           | Copper       | Cu             | 29               | ANTIQUITY      |
| -3000           | Silver       | Ag             | 47               | ANTIQUITY      |
| -3000           | Gold         | Au             | 79               | ANTIQUITY      |
| -2500           | Iron         | Fe             | 26               | ANTIQUITY      |
| -2100           | Tin          | Sn             | 50               | ANTIQUITY      |
| -1600           | Antimony     | Sb             | 51               | ANTIQUITY      |
| -1000           | Mercury      | Hg             | 80               | ANTIQUITY      |
| -1000           | Lead         | Pb             | 82               | ANTIQUITY      |
| 1250            | Arsenic      | As             | 33               | MAGNUS         |
| 1374            | Zinc         | Zn             | 30               | UNKNOWN        |
| 1500            | Bismuth      | Bi             | 83               | UNKNOWN        |
| 1669            | Phosphorus   | P              | 15               | BRAND          |
| 1700            | Platinum     | Pt             | 78               | ANTIQUITY      |
| 1735            | Cobald       | Co             | 27               | BRANDT         |
| 1751            | Nickel       | Ni             | 28               | CRONSTEDT      |
| 1755            | Magnesium    | Mg             | 12               | BLACK          |
| 1766            | Hydrogen     | H              | 1                | CAVENDISH      |
| 1772            | Nitrogen     | N              | 7                | RUTHERFORD, D. |
| 1774            | Oxygen       | O              | 8                | SCHEELE        |
| 1774            | Chlorine     | Cl             | 17               | SCHEELE        |
| 1774            | Manganese    | Mn             | 25               | GAHN           |

|      |            |    |    |                                    |
|------|------------|----|----|------------------------------------|
| 1780 | Chromium   | Cr | 24 | KLAPROTH; VAUQUELIN                |
| 1781 | Molybdenum | Mo | 42 | HJELM                              |
| 1783 | Tungsten   | W  | 74 | D'ELHUYAR                          |
| 1789 | Zirconium  | Zr | 40 | KLAPROTH                           |
| 1789 | Uranium    | U  | 92 | KLAPROTH                           |
| 1792 | Titanium   | Ti | 22 | KLAPROTH                           |
| 1793 | Strontium  | Sr | 38 | KLAPROTH                           |
| 1794 | Yttrium    | Y  | 39 | GADOLIN                            |
| 1797 | Beryllium  | Be | 4  | KLAPROTH; VAUQUELIN                |
| 1798 | Tellurium  | Te | 52 | KLAPROTH                           |
| 1801 | Vanadium   | V  | 23 | DEL RIO                            |
| 1801 | Niobium    | Nb | 41 | HATCHETT                           |
| 1802 | Tantalum   | Ta | 73 | EKEBERG                            |
| 1803 | Rhodium    | Rh | 45 | WOLLASTON                          |
| 1803 | Palladium  | Pd | 46 | WOLLASTON                          |
| 1803 | Cerium     | Ce | 58 | KLAPROTH; BERZELIUS;<br>HISINGER   |
| 1803 | Osmium     | Os | 76 | TENNANT                            |
| 1803 | Iridium    | Ir | 77 | TENNANT                            |
| 1807 | Sodium     | Na | 11 | DAVY                               |
| 1807 | Potassium  | K  | 19 | DAVY                               |
| 1808 | Boron      | B  | 5  | THENARD; GAY-<br>LUSSAC            |
| 1808 | Calcium    | Ca | 20 | DAVY                               |
| 1808 | Ruthenium  | Ru | 44 | SNIADECKI, OSANN,<br>CLAUS (KLAUS) |
| 1808 | Barium     | Ba | 56 | DAVY                               |
| 1811 | Iodine     | I  | 53 | COURTOIS                           |
| 1815 | Thorium    | Th | 90 | BERZELIUS                          |
| 1817 | Lithium    | Li | 3  | ARFVEDSON                          |
| 1817 | Selenium   | Se | 34 | BERZELIUS                          |
| 1817 | Cadmium    | Cd | 48 | STROMEYER; DAVY                    |

|      |              |    |    |                      |
|------|--------------|----|----|----------------------|
| 1824 | Silicon      | Si | 14 | BERZELIUS            |
| 1825 | Aluminum     | Al | 13 | OERSTED              |
| 1826 | Bromine      | Br | 35 | LOWIG; BALARD        |
| 1839 | Lanthanum    | La | 57 | MOSANDER             |
| 1842 | Erbium       | Er | 68 | MOSANDER             |
| 1843 | Terbium      | Tb | 65 | MOSANDER             |
| 1860 | Cesium       | Cs | 55 | BUNSEN; KIRCHHOFF    |
| 1861 | Rubidium     | Rb | 37 | BUNSEN; KIRCHHOFF    |
| 1861 | Thalium      | Tl | 81 | CROOKES              |
| 1863 | Indium       | In | 49 | REICH; RICHTER       |
| 1875 | Gallium      | Ga | 31 | BOISBAUDRAN          |
| 1878 | Holmium      | Ho | 67 | CLEVE                |
| 1878 | Ytterbium    | Yb | 70 | MARIGNAC             |
| 1879 | Scandium     | Sc | 21 | NILSON               |
| 1879 | Samarium     | Sm | 62 | BOISBAUDRAN          |
| 1879 | Thulium      | Tm | 69 | CLEVE                |
| 1880 | Gadolinium   | Gd | 64 | MARIGNAC             |
| 1885 | Praesodymium | Pr | 59 | VON AUER             |
| 1885 | Neodymium    | Nd | 60 | VON AUER             |
| 1886 | Fluorine     | F  | 9  | MOISSAN              |
| 1886 | Germanium    | Ge | 32 | WINKLER              |
| 1886 | Dysprosium   | Dy | 66 | BOISBAUDRAN          |
| 1894 | Argon        | Ar | 18 | RAMSAY; TRAVERS      |
| 1895 | Helium       | He | 2  | RAMSAY; TRAVERS      |
| 1898 | Neon         | Ne | 10 | RAMSAY; TRAVERS      |
| 1898 | Krypton      | Kr | 36 | RAMSAY; TRAVERS      |
| 1898 | Xenon        | Xe | 54 | RAMSAY; TRAVERS      |
| 1898 | Polonium     | Po | 84 | CURIE, M.; CURIE, P. |
| 1898 | Radium       | Ra | 88 | CURIE, M.; CURIE, P. |
| 1899 | Actinium     | Ac | 89 | DEBIERNE             |
| 1900 | Radon        | Rn | 86 | DORN                 |
| 1901 | Europium     | Eu | 63 | DEMARCA              |

|      |               |    |     |                                    |
|------|---------------|----|-----|------------------------------------|
| 1907 | Lutetium      | Lu | 71  | URBAIN                             |
| 1917 | Protactinium  | Pa | 91  | SODDY; MEITNER;<br>FAJAN           |
| 1923 | Hafnium       | Hf | 72  | COSTER                             |
| 1925 | Rhenium       | Re | 75  | NODDACK, W.;<br>NODDACK, I.        |
| 1939 | Francium      | Fr | 87  | PEREY                              |
| 1940 | Astatine      | At | 85  | SEGRE; CORSON;<br>MACKENZIE; SEGRE |
| 1940 | Neptunium     | Np | 93  | ABELSON; MCMILLAN;<br>SEABORG      |
| 1940 | Plutonium     | Pu | 94  | SEABORG                            |
| 1943 | Technetium    | Tc | 43  | SEGRE                              |
| 1944 | Americium     | Am | 95  | SEABORG                            |
| 1944 | Curium        | Cm | 96  | SEABORG                            |
| 1945 | Promethium    | Pm | 61  | CORYELL; MARINSKY                  |
| 1949 | Berkelium     | Bk | 97  | SEABORG; THOMPSON                  |
| 1950 | Californium   | Cf | 98  | SEABORG; THOMPSON                  |
| 1952 | Einsteinium   | Es | 99  | CHOPPIN; THOMPSON                  |
| 1952 | Fermium       | Fm | 100 | CHOPPIN; THOMPSON                  |
| 1955 | Mendelevium   | Md | 101 | CHOPPIN; SEABORG;<br>THOMPSON      |
| 1958 | Nobelium      | No | 102 | SEABORG                            |
| 1961 | Lawrencium    | Lr | 103 | LAWRENCE                           |
| 1964 | Rutherfordium | Rf | 104 | VARIOUS RUSSIANS                   |
| 1967 | Dubnium       | Db | 105 | VARIOUS RUSSIANS                   |
| 1974 | Seaborgium    | Sg | 106 | GHIORSO                            |
| 1981 | Bohrium       | Bh | 107 | GHIORSO                            |
| 1982 | Meitnerium    | Mt | 109 | ARMBRUSTER;<br>MUENZENBERG         |
| 1984 | Hassium       | Hs | 108 | GHIORSO                            |
| 1994 | Darmstadtium  | Dm | 110 | ARMBRUSTER;                        |

|  |  |  |  |        |
|--|--|--|--|--------|
|  |  |  |  | HOFMAN |
|--|--|--|--|--------|



### TIMELINE OF DISCOVERY OF ELEMENTS OF PERIODIC TABLE

