



# WebElements: the periodic table on the world-wide web

<http://www.webelements.com/>

1 hydrogen <b>1</b> <b>H</b> 1.00794(7)	2 beryllium <b>4</b> <b>Be</b> 9.012182(3)	3 lithium <b>3</b> <b>Li</b> 6.941(2)	4 beryllium <b>4</b> <b>Be</b> 9.012182(3)	5 boron <b>5</b> <b>B</b> 10.811(7)	6 carbon <b>6</b> <b>C</b> 12.0107(8)	7 nitrogen <b>7</b> <b>N</b> 14.00674(7)	8 oxygen <b>8</b> <b>O</b> 15.9994(3)	9 fluorine <b>9</b> <b>F</b> 18.9984032(5)	10 neon <b>10</b> <b>Ne</b> 20.1797(6)	11 sodium <b>11</b> <b>Na</b> 22.989770(2)	12 magnesium <b>12</b> <b>Mg</b> 24.3050(6)	13 aluminum <b>13</b> <b>Al</b> 26.981538(2)	14 silicon <b>14</b> <b>Si</b> 28.0855(3)	15 phosphorus <b>15</b> <b>P</b> 30.973761(2)	16 sulfur <b>16</b> <b>S</b> 32.065(5)	17 chlorine <b>17</b> <b>Cl</b> 35.453(2)	18 argon <b>18</b> <b>Ar</b> 39.948(1)	
19 potassium <b>19</b> <b>K</b> 39.0983(1)	20 calcium <b>20</b> <b>Ca</b> 40.078(4)	21 scandium <b>21</b> <b>Sc</b> 44.955910(8)	22 titanium <b>22</b> <b>Ti</b> 47.867(1)	23 vanadium <b>23</b> <b>V</b> 50.9415(1)	24 chromium <b>24</b> <b>Cr</b> 51.9961(6)	25 manganese <b>25</b> <b>Mn</b> 54.938049(9)	26 iron <b>26</b> <b>Fe</b> 55.845(2)	27 cobalt <b>27</b> <b>Co</b> 58.933200(9)	28 nickel <b>28</b> <b>Ni</b> 58.6934(2)	29 copper <b>29</b> <b>Cu</b> 63.546(3)	30 zinc <b>30</b> <b>Zn</b> 65.409(4)	31 gallium <b>31</b> <b>Ga</b> 69.723(1)	32 germanium <b>32</b> <b>Ge</b> 72.64(1)	33 arsenic <b>33</b> <b>As</b> 74.92160(2)	34 selenium <b>34</b> <b>Se</b> 78.96(3)	35 bromine <b>35</b> <b>Br</b> 79.904(1)	36 krypton <b>36</b> <b>Kr</b> 83.798(2)	
37 rubidium <b>37</b> <b>Rb</b> 85.4678(3)	38 strontium <b>38</b> <b>Sr</b> 87.62(1)	39 yttrium <b>39</b> <b>Y</b> 88.90585(2)	40 zirconium <b>40</b> <b>Zr</b> 91.224(2)	41 niobium <b>41</b> <b>Nb</b> 92.90638(2)	42 molybdenum <b>42</b> <b>Mo</b> 95.94(1)	43 technetium <b>43</b> <b>Tc</b> [98]	44 ruthenium <b>44</b> <b>Ru</b> 101.07(2)	45 rhodium <b>45</b> <b>Rh</b> 102.90550(2)	46 palladium <b>46</b> <b>Pd</b> 106.42(1)	47 silver <b>47</b> <b>Ag</b> 107.8682(2)	48 cadmium <b>48</b> <b>Cd</b> 112.411(8)	49 indium <b>49</b> <b>In</b> 114.818(3)	50 tin <b>50</b> <b>Sn</b> 118.710(7)	51 antimony <b>51</b> <b>Sb</b> 121.760(1)	52 tellurium <b>52</b> <b>Te</b> 127.60(3)	53 iodine <b>53</b> <b>I</b> 126.90447(3)	54 xenon <b>54</b> <b>Xe</b> 131.293(6)	
55 caesium <b>55</b> <b>Cs</b> 132.90545(2)	56 barium <b>56</b> <b>Ba</b> 137.327(7)	57-70 * <b>Lu</b>	71 lutetium <b>71</b> <b>Lu</b> 174.967(1)	72 hafnium <b>72</b> <b>Hf</b> 178.49(2)	73 tantalum <b>73</b> <b>Ta</b> 180.9479(1)	74 tungsten <b>74</b> <b>W</b> 183.84(1)	75 rhenium <b>75</b> <b>Re</b> 186.207(1)	76 osmium <b>76</b> <b>Os</b> 190.23(3)	77 iridium <b>77</b> <b>Ir</b> 192.217(3)	78 platinum <b>78</b> <b>Pt</b> 195.078(2)	79 gold <b>79</b> <b>Au</b> 196.96655(2)	80 mercury <b>80</b> <b>Hg</b> 200.59(2)	81 thallium <b>81</b> <b>Tl</b> 204.3833(2)	82 lead <b>82</b> <b>Pb</b> 207.2(1)	83 bismuth <b>83</b> <b>Bi</b> 208.98038(2)	84 polonium <b>84</b> <b>Po</b> [209]	85 astatine <b>85</b> <b>At</b> [210]	86 radon <b>86</b> <b>Rn</b> [222]
87 francium <b>87</b> <b>Fr</b> [223]	88 radium <b>88</b> <b>Ra</b> [226]	89-102 ** <b>Lr</b>	103 lawrencium <b>103</b> <b>Lr</b> [262]	104 rutherfordium <b>104</b> <b>Rf</b> [261]	105 dubnium <b>105</b> <b>Db</b> [262]	106 seaborgium <b>106</b> <b>Sg</b> [266]	107 bohrium <b>107</b> <b>Bh</b> [264]	108 hassium <b>108</b> <b>Hs</b> [269]	109 meitnerium <b>109</b> <b>Mt</b> [268]	110 ununnium <b>110</b> <b>Uun</b> [271]	111 ununium <b>111</b> <b>Uuu</b> [272]	112 ununbium <b>112</b> <b>Uub</b> [285]	113 ununtrium <b>113</b> <b>Uut</b> [286]	114 ununquadium <b>114</b> <b>Uuq</b> [289]	115 ununpentium <b>115</b> <b>Uup</b> [290]	116 ununhexium <b>116</b> <b>Uuh</b> [291]	117 ununseptium <b>117</b> <b>Uus</b> [292]	118 ununoctium <b>118</b> <b>Uuo</b> [293]

**Key:**

element name
atomic number
symbol

2001 atomic weight (mean relative mass)

\*lanthanoids

\*\*actinoids

lanthanum <b>57</b> <b>La</b> 138.9055(2)	cerium <b>58</b> <b>Ce</b> 140.116(1)	praseodymium <b>59</b> <b>Pr</b> 140.90765(2)	neodymium <b>60</b> <b>Nd</b> 144.24(3)	promethium <b>61</b> <b>Pm</b> [145]	samarium <b>62</b> <b>Sm</b> 150.36(3)	europium <b>63</b> <b>Eu</b> 151.964(1)	gadolinium <b>64</b> <b>Gd</b> 157.25(3)	terbium <b>65</b> <b>Tb</b> 158.92534(2)	dysprosium <b>66</b> <b>Dy</b> 162.500(1)	holmium <b>67</b> <b>Ho</b> 164.93032(2)	erbium <b>68</b> <b>Er</b> 167.259(3)	thulium <b>69</b> <b>Tm</b> 168.93421(2)	ytterbium <b>70</b> <b>Yb</b> 173.04(3)
actinium <b>89</b> <b>Ac</b> [227]	thorium <b>90</b> <b>Th</b> 232.0381(1)	protactinium <b>91</b> <b>Pa</b> 231.03588(2)	uranium <b>92</b> <b>U</b> 238.02891(3)	neptunium <b>93</b> <b>Np</b> [237]	plutonium <b>94</b> <b>Pu</b> [244]	americium <b>95</b> <b>Am</b> [243]	curium <b>96</b> <b>Cm</b> [247]	berkelium <b>97</b> <b>Bk</b> [247]	californium <b>98</b> <b>Cf</b> [251]	einsteinium <b>99</b> <b>Es</b> [252]	fermium <b>100</b> <b>Fm</b> [257]	mendelevium <b>101</b> <b>Md</b> [258]	nobelium <b>102</b> <b>No</b> [259]

**Element symbols and names:** symbols, names, and spellings are those recommended by IUPAC (<http://www.iupac.org/>). After controversy, the names of elements 101-109 are now confirmed (Pure & Appl. Chem., 1997, **69**, 2471-2473). Names have yet to be proposed for the elements 110-112, and 114 - those used here are IUPAC's temporary systematic names (Pure & Appl. Chem., 1979, **51**, 381-384). In the USA and some other countries, the spellings **aluminum** and **cesium** are normal while in the UK and elsewhere the usual spelling is **sulphur**.

**Atomic weights (mean relative masses):** Apart from the heaviest elements, these are IUPAC 2001 values (Pure & Appl. Chem., 2001, **73**, 667-683). Elements with values given in brackets have no stable nuclides and are represented by 5-figure values for the longest-lived isotope. The elements thorium, protactinium, and uranium have characteristic terrestrial abundances and these are the values quoted. The last significant figure of each value is considered reliable to  $\pm 1$  except where a larger uncertainty is given in parentheses.

**Periodic table organisation:** for a justification of the positions of the elements La, Ac, Lu, and Lr in the WebElements periodic table see W.B. Jensen, "The positions of lanthanum (actinium) and lutetium (lawrencium) in the periodic table", J. Chem. Ed., 1982, **59**, 634-636.

**Group labels:** the numeric system (1-18) used here is the current IUPAC convention. For a discussion of this and other common systems see: W.C. Fernelius and W.H. Powell, "Confusion in the periodic table of the elements", J. Chem. Ed., 1982, **59**, 504-508.

©2002 Dr Mark J Winter IWebElements Ltd and University of Sheffield. All rights reserved. For updates to this table see <http://www.webelements.com/webelements/support/media/pdf/>. **Version date:** 3 Apr 2002.

# The WebElements™ printable periodic table

## Printing the WebElements printable periodic table

You can use this Adobe Acrobat file to print single or multiple copies of the periodic table. For printing advice, consult the Adobe Acrobat documentation. The **WEB\_ELEM.PDF** file has been used successfully to print on A4 paper but should also print on US letter sized paper.

## Web Links

If you are connected to the InterNet and your Adobe Acrobat software is sufficiently current, click on any of the elements in the periodic table from within the Adobe Acrobat reader to retrieve information about that element from the WebElements site. To do this, you will need an appropriate Web browser program. You may need to update your Adobe Acrobat Reader program [<http://www.adobe.com/acrobat/>].

## WebElements

WebElements is the periodic table on the world-wide web. WebElements is located at <http://www.webelements.com/>.

## Updates

For updates to this table see <http://www.webelements.com/webelements/support/media/pdf/>. This version of the WebElements printable periodic table is dated 03 April 2002.

## Conditions of use

The author endeavours to ensure the information in the WebElements printable periodic table is correct but a condition of your use of it is that you accept the author has no liability for problems arising from your use of the WebElements printable periodic table.

You are free to distribute this file **WEB\_ELEM.PDF** by any means provided you do not charge for the file or its distribution, and you do not change the name of the file or change it in any other way. Proposals regarding commercial distribution of this file should be made to the author. You may print and distribute as many copies of the periodic table from the **WEB\_ELEM.PDF** file as you wish for any purpose provided you do not charge for those copies. Proposals regarding commercial distribution of printed copies of the periodic table generated from the **WEB\_ELEM.PDF** file should be made to the author.

## Copyright

©2002 Dr Mark J Winter [webelements@sheffield.ac.uk], WebElements Ltd. and University of Sheffield.  
Department of Chemistry  
The University  
Sheffield S3 7HF, England

The author retains copyright on this WebElements printable periodic table file. You are licensed on a non-exclusive basis to use the file but you do not own the **WEB\_ELEM.PDF** file and the copyright owner reserves all rights worldwide.