



Dr. Paul Lohmann®

| 1   | 2  |
|---|--|
| Ia  | IIa  |
| <b>1</b><br>Hydrogen<br><b>H</b><br>1.008<br>-259.19<br>-252.9<br>2.2<br>0.084<br>-1,1<br>1s <sup>1</sup> | <b>4</b><br>Beryllium<br><b>Be</b><br>9.012<br>1278<br>2477<br>1.5<br>1.85<br>2<br>[He] 2s <sup>2</sup>    |
| <b>3</b><br>Lithium<br><b>Li</b><br>6.941<br>180.5<br>1347<br>1.0<br>0.53<br>1<br>[He] 2s <sup>1</sup>    | <b>12</b><br>Magnesium<br><b>Mg</b><br>24.305<br>648.8<br>1105<br>1.2<br>1.74<br>2<br>[Ne] 3s <sup>2</sup> |
| <b>11</b><br>Sodium<br><b>Na</b><br>22.990<br>97.8<br>881.3<br>1.0<br>0.97<br>1<br>[Ne] 3s <sup>1</sup>   | <b>20</b><br>Calcium<br><b>Ca</b><br>40.078<br>839<br>1483<br>1.0<br>1.54<br>2<br>[Ar] 4s <sup>2</sup>     |
| <b>37</b><br>Rubidium<br><b>Rb</b><br>85.468<br>38.9<br>688<br>0.9<br>1.53<br>1<br>[Kr] 5s <sup>1</sup>   | <b>38</b><br>Strontium<br><b>Sr</b><br>87.62<br>769<br>1385<br>1.0<br>2.63<br>2<br>[Kr] 5s <sup>2</sup>    |
| <b>55</b><br>Caesium<br><b>Cs</b><br>132.905<br>28.4<br>705<br>0.9<br>1.90<br>1<br>[Xe] 6s <sup>1</sup>   | <b>56</b><br>Barium<br><b>Ba</b><br>137.327<br>725<br>1696<br>1.0<br>3.65<br>2<br>[Xe] 6s <sup>2</sup>     |
| <b>87</b><br>Francium<br><b>Fr</b><br>*223.020<br>~27<br>~680<br>0.9<br>1<br>1<br>[Rn] 7s <sup>1</sup>    | <b>88</b><br>Radium<br><b>Ra</b><br>*226.025<br>700<br>1140<br>1.0<br>5.50<br>2<br>[Rn] 7s <sup>2</sup>    |

|   |
|---|
| <b>26</b><br>Iron<br><b>Fe</b><br>55.845<br>1535<br>3070<br>1.6<br>7.87<br>-2,0,2,3,6<br>[Ar] 3d <sup>6</sup> 4s <sup>2</sup> |
|---|

- 1 Atomic number
- 2 Element symbol
- 3 Relative atomic mass
- 4 Melting point
- 5 Boiling point
- 6 Electronegativity (Alfred, Rochow)
- 7 Density (g/cm<sup>3</sup>, 20°C) (gaseous elements g/l, 1.013 bar)
- 8 Oxidation states (most important)
- 9 Electron configuration

### Periodic Table of the Elements

\* most stable isotope

Metals

Nonmetals

Transition metals

Elements of the f-series

Column labelling

IUPAC, Nomenclature of Inorganic Chemistry, 1989

IUPAC, Rules for Inorganic Nomenclature, 1970

| 3  | 4  | 5   | 6   | 7   | 8  | 9   | 10  | 11  | 12  |  |   |
|--|--|---|---|---|--|---|---|---|---|--|---|
| IIIB   | IVB  | VB  | VIB   | VIIb  | VIII   |   |   | IB  | IIB   |  |   |
| <b>21</b><br>Scandium<br><b>Sc</b><br>44.956<br>1660<br>2832<br>1.2<br>2.99<br>3<br>[Ar] 3d <sup>1</sup> 4s <sup>2</sup> | <b>22</b><br>Titanium<br><b>Ti</b><br>47.887<br>1669<br>3262<br>1.3<br>4.51<br>3,4<br>[Ar] 3d <sup>2</sup> 4s <sup>2</sup> | <b>23</b><br>Vanadium<br><b>V</b><br>50.942<br>1890<br>3400<br>1.5<br>6.09<br>0,2,3,4,5<br>[Ar] 3d <sup>3</sup> 4s <sup>2</sup> | <b>24</b><br>Chromium<br><b>Cr</b><br>51.996<br>1857<br>2640<br>1.6<br>7.14<br>0,2,3,6<br>[Ar] 3d <sup>5</sup> 4s <sup>1</sup>            | <b>25</b><br>Manganese<br><b>Mn</b><br>54.938<br>1244<br>2030<br>1.6<br>7.44<br>-1,0,2,3,4,6,7<br>[Ar] 3d <sup>5</sup> 4s <sup>2</sup>      | <b>26</b><br>Iron<br><b>Fe</b><br>55.845<br>1535<br>3070<br>1.6<br>7.87<br>-2,0,2,3,6<br>[Ar] 3d <sup>6</sup> 4s <sup>2</sup>                        | <b>27</b><br>Cobalt<br><b>Co</b><br>58.933<br>1495<br>3100<br>1.7<br>8.89<br>-1,0,2,3<br>[Ar] 3d <sup>7</sup> 4s <sup>2</sup>                       | <b>28</b><br>Nickel<br><b>Ni</b><br>58.693<br>1453<br>2730<br>1.8<br>8.91<br>0,2,3<br>[Ar] 3d <sup>8</sup> 4s <sup>2</sup>                            | <b>29</b><br>Copper<br><b>Cu</b><br>63.546<br>1083.4<br>2595<br>1.8<br>8.92<br>1,2<br>[Ar] 3d <sup>10</sup> 4s <sup>1</sup>                             | <b>30</b><br>Zinc<br><b>Zn</b><br>65.39<br>419.6<br>908.5<br>1.7<br>7.14<br>2<br>[Ar] 3d <sup>10</sup> 4s <sup>2</sup>                          |  |   |
| <b>39</b><br>Yttrium<br><b>Y</b><br>88.906<br>1523<br>3337<br>1.1<br>4.47<br>3<br>[Kr] 4d <sup>1</sup> 5s <sup>2</sup>   | <b>40</b><br>Zirconium<br><b>Zr</b><br>91.224<br>1852<br>3578<br>1.2<br>6.51<br>4<br>[Kr] 4d <sup>2</sup> 5s <sup>2</sup>  | <b>41</b><br>Niobium<br><b>Nb</b><br>92.906<br>2468<br>4930<br>1.2<br>8.58<br>3,5<br>[Kr] 4d <sup>4</sup> 5s <sup>1</sup>       | <b>42</b><br>Molybdenum<br><b>Mo</b><br>95.94<br>2617<br>4825<br>1.3<br>10.28<br>0,2,3,4,5,6<br>[Kr] 4d <sup>5</sup> 5s <sup>1</sup>      | <b>43</b><br>Technetium<br><b>Tc</b><br>*98.906<br>2617<br>4700<br>1.4<br>11.49<br>7<br>[Kr] 4d <sup>6</sup> 5s <sup>1</sup>                | <b>44</b><br>Ruthenium<br><b>Ru</b><br>101.07<br>2310<br>4150<br>1.4<br>12.45<br>-1,2,4,6,7<br>[Kr] 4d <sup>7</sup> 5s <sup>1</sup>                  | <b>45</b><br>Rhodium<br><b>Rh</b><br>102.906<br>1966<br>3670<br>1.5<br>12.41<br>0,2,1,3,4,5<br>[Kr] 4d <sup>8</sup> 5s <sup>1</sup>                 | <b>46</b><br>Palladium<br><b>Pd</b><br>106.42<br>2930<br>3670<br>1.4<br>12.02<br>0,2,4<br>[Kr] 4d <sup>10</sup>                                       | <b>47</b><br>Silver<br><b>Ag</b><br>107.868<br>961.9<br>2212<br>1.4<br>10.49<br>1,2<br>[Kr] 4d <sup>10</sup> 5s <sup>1</sup>                            | <b>48</b><br>Cadmium<br><b>Cd</b><br>112.411<br>320.9<br>767.3<br>1.5<br>8.64<br>2<br>[Kr] 4d <sup>10</sup> 5s <sup>2</sup>                     |  |   |
| <b>57-71</b><br>Lanthanides<br><b>La-Lu</b>  |  |   | <b>72</b><br>Hafnium<br><b>Hf</b><br>178.49<br>2227<br>5400<br>1.2<br>13.31<br>4<br>[Xe] 4f <sup>14</sup> 5d <sup>2</sup> 6s <sup>2</sup> | <b>73</b><br>Tantalum<br><b>Ta</b><br>180.948<br>2996<br>5425<br>1.4<br>16.68<br>5<br>[Xe] 4f <sup>14</sup> 5d <sup>3</sup> 6s <sup>2</sup> | <b>74</b><br>Tungsten<br><b>W</b><br>183.84<br>3410<br>~5700<br>1.4<br>19.26<br>0,2,3,4,5,6<br>[Xe] 4f <sup>14</sup> 5d <sup>4</sup> 6s <sup>2</sup> | <b>75</b><br>Rhenium<br><b>Re</b><br>186.207<br>3180<br>5870<br>1.5<br>21.03<br>-1,2,4,6,7<br>[Xe] 4f <sup>14</sup> 5d <sup>5</sup> 6s <sup>2</sup> | <b>76</b><br>Osmium<br><b>Os</b><br>190.23<br>3045<br>5020<br>1.5<br>22.61<br>-2,0,2,3,4,6,8<br>[Xe] 4f <sup>14</sup> 5d <sup>6</sup> 6s <sup>2</sup> | <b>77</b><br>Iridium<br><b>Ir</b><br>192.217<br>2410<br>4530<br>1.6<br>22.65<br>-1,0,1,2,3,4,6<br>[Xe] 4f <sup>14</sup> 5d <sup>7</sup> 6s <sup>2</sup> | <b>78</b><br>Platinum<br><b>Pt</b><br>195.078<br>1772<br>3830<br>1.4<br>21.45<br>0,2,4<br>[Xe] 4f <sup>14</sup> 5d <sup>9</sup> 6s <sup>1</sup> | <b>79</b><br>Gold<br><b>Au</b><br>196.967<br>1064.4<br>2660<br>1.4<br>19.32<br>1,3<br>[Xe] 4f <sup>14</sup> 5d <sup>10</sup> 6s <sup>1</sup> | <b>80</b><br>Mercury<br><b>Hg</b><br>200.59<br>-38.84<br>356.6<br>1.5<br>13.55<br>1,2<br>[Xe] 4f <sup>14</sup> 5d <sup>10</sup> 6s <sup>2</sup> |
| <b>89-103</b><br>Actinides<br><b>Ac-Lr</b>   |  |   | <b>104</b><br>Rutherfordium<br><b>Rf</b><br>*261.109  | <b>105</b><br>Dubnium<br><b>Db</b><br>*262.114  | <b>106</b><br>Seaborgium<br><b>Sg</b><br>*263.119  | <b>107</b><br>Bohrium<br><b>Bh</b><br>*262.123  | <b>108</b><br>Hassium<br><b>Hs</b><br>*265.131  | <b>109</b><br>Meitnerium<br><b>Mt</b><br>*266.138   | <b>110</b><br>Darmstadtium<br><b>Ds</b><br>*269   | <b>111</b><br>Roentgenium<br><b>Rg</b><br>*272   | <b>112</b><br>Ununbium<br><b>Uub</b><br>*277  |

| 13  | 14  | 15  | 16  | 17   | 18  |
|---|---|---|---|--|---|
| IIIA  | IVA   | VA  | VIa   | VIIa   | VIIIA   |
| <b>5</b><br>Boron<br><b>B</b><br>10.811<br>2180<br>3660<br>2.0<br>2.35a<br>3<br>[He] 2s <sup>2</sup> 2p <sup>1</sup>                      | <b>6</b><br>Carbon<br><b>C</b><br>12.011<br>3550d<br>4827<br>2.5<br>3.51d<br>-4,2,4<br>3<br>[He] 2s <sup>2</sup> 2p <sup>2</sup>              | <b>7</b><br>Nitrogen<br><b>N</b><br>14.007<br>-209.99<br>-195.8<br>2.5<br>3.1d<br>-4,2,4<br>3<br>[He] 2s <sup>2</sup> 2p <sup>3</sup>                   | <b>8</b><br>Oxygen<br><b>O</b><br>15.999<br>-218.75<br>-183.0<br>3.1<br>1.17<br>-3,2,3,4,5<br>3<br>[He] 2s <sup>2</sup> 2p <sup>4</sup>                 | <b>9</b><br>Fluorine<br><b>F</b><br>18.998<br>-219.61<br>-188.1<br>4.1<br>3.5<br>-2,-1<br>3<br>[He] 2s <sup>2</sup> 2p <sup>5</sup>                      | <b>10</b><br>Neon<br><b>Ne</b><br>20.180<br>-248.61<br>-246.08<br>0.84<br>1s <sup>2</sup><br>[He] 2s <sup>2</sup> 2p <sup>6</sup>               |
| <b>13</b><br>Aluminium<br><b>Al</b><br>26.982<br>660.4<br>2330<br>1.5<br>2.70<br>3<br>[Ne] 3s <sup>2</sup> 3p <sup>1</sup>                | <b>14</b><br>Silicon<br><b>Si</b><br>28.086<br>1410<br>2477<br>1.7<br>2.33<br>-4,4<br>3<br>[Ne] 3s <sup>2</sup> 3p <sup>2</sup>               | <b>15</b><br>Phosphorus<br><b>P</b><br>30.974<br>44.1w<br>280.5w<br>2.1<br>1.82w<br>-3,3,5<br>3<br>[Ne] 3s <sup>2</sup> 3p <sup>3</sup>                 | <b>16</b><br>Sulfur<br><b>S</b><br>32.065<br>119.6m<br>444.6<br>2.4<br>2.07r<br>-2,2,4,6<br>3<br>[Ne] 3s <sup>2</sup> 3p <sup>4</sup>                   | <b>17</b><br>Chlorine<br><b>Cl</b><br>35.453<br>-101.00<br>-34.6<br>2.8<br>2.95<br>-1,1,3,5,7<br>3<br>[Ne] 3s <sup>2</sup> 3p <sup>5</sup>               | <b>18</b><br>Argon<br><b>Ar</b><br>39.948<br>-189.37<br>-185.88<br>1.66<br>[Ne] 3s <sup>2</sup> 3p <sup>6</sup>                                 |
| <b>31</b><br>Gallium<br><b>Ga</b><br>69.723<br>29.8<br>2250<br>1.8<br>5.91<br>3<br>[Ar] 3d <sup>10</sup> 4s <sup>2</sup> 4p <sup>1</sup>  | <b>32</b><br>Germanium<br><b>Ge</b><br>72.64<br>937.4<br>2830<br>2.0<br>5.32<br>4<br>[Ar] 3d <sup>10</sup> 4s <sup>2</sup> 4p <sup>2</sup>    | <b>33</b><br>Arsenic<br><b>As</b><br>74.922<br>613.3subl<br>5.72<br>2.2<br>5.32<br>-3,3,5<br>3<br>[Ar] 3d <sup>10</sup> 4s <sup>2</sup> 4p <sup>3</sup> | <b>34</b><br>Selenium<br><b>Se</b><br>78.96<br>221.9r<br>684.8<br>2.5<br>4.19gr<br>-2,4,6<br>3<br>[Ar] 3d <sup>10</sup> 4s <sup>2</sup> 4p <sup>4</sup> | <b>35</b><br>Bromine<br><b>Br</b><br>79.904<br>-7.25<br>58.8<br>2.7<br>3.14<br>-1,1,3,5,7<br>3<br>[Ar] 3d <sup>10</sup> 4s <sup>2</sup> 4p <sup>5</sup>  | <b>36</b><br>Krypton<br><b>Kr</b><br>83.80<br>-157.20<br>-153.35<br>3.48<br>[Ar] 3d <sup>10</sup> 4s <sup>2</sup> 4p <sup>6</sup>               |
| <b>49</b><br>Indium<br><b>In</b><br>114.818<br>156.6<br>2070<br>1.5<br>7.31<br>3<br>[Kr] 4d <sup>10</sup> 5s <sup>2</sup> 5p <sup>1</sup> | <b>50</b><br>Tin<br><b>Sn</b><br>118.710<br>232.0<br>2687<br>1.8<br>7.29<br>2,4<br>3<br>[Kr] 4d <sup>10</sup> 5s <sup>2</sup> 5p <sup>2</sup> | <b>51</b><br>Antimony<br><b>Sb</b><br>121.760<br>630.7<br>1635<br>1.8<br>6.69<br>-3,3,5<br>3<br>[Kr] 4d <sup>10</sup> 5s <sup>2</sup> 5p <sup>3</sup>   | <b>52</b><br>Tellurium<br><b>Te</b><br>127.60<br>449.5<br>1390<br>2.0<br>6.25<br>-2,4,6<br>3<br>[Kr] 4d <sup>10</sup> 5s <sup>2</sup> 5p <sup>4</sup>   | <b>53</b><br>Iodine<br><b>I</b><br>126.904<br>113.5<br>185.24<br>2.2<br>4.94<br>-1,1,3,5,7<br>3<br>[Kr] 4d <sup>10</sup> 5s <sup>2</sup> 5p <sup>5</sup> | <b>54</b><br>Xenon<br><b>Xe</b><br>131.29<br>-111.80<br>-108.10<br>5.49<br>[Kr] 4d <sup>10</sup> 5s <sup>2</sup> 5p <sup>6</sup>                |
| <b>81</b><br>Thallium<br><b>Tl</b><br>204.383<br>303.5<br>1453<br>11.85<br>1,3  | <b>82</b><br>Lead<br><b>Pb</b><br>207.2<br>327.5<br>1751<br>11.34<br>2,4  | <b>83</b><br>Bismuth<br><b>Bi</b><br>208.980<br>271.3<br>1580<br>9.80<br>3,5  | <b>84</b><br>Polonium<br><b>Po</b><br>*208.982<br>254<br>962<br>9.2<br>2,4,6  | <b>85</b><br>Astatine<br><b>At</b><br>*209.987<br>~302<br>~370<br>2.0<br>-1,1,3,5,7  | <b>86</b><br>Radon<br><b>Rn</b><br>*222.018<br>-71.1<br>-62.1<br>9.23<br>[Xe] 4f <sup>14</sup> 5d <sup>10</sup> 6s <sup>2</sup> 6p <sup>6</sup> |

blue: in Dr. Paul Lohmann products

\*\* IUPAC Recommendation

|   |  |   |   |   |   |  |  |   |   |   |  |   |   |  |
|---|--|---|---|---|---|--|--|---|---|---|--|---|---|--|
| <b>Lanthanides</b>  |  |   |   |   |   |  |  |   |   |   |  |   |   |  |
| <b>57</b><br>Lanthanum<br><b>La</b><br>138.906<br>920<br>3454<br>1.1<br>6.16<br>3<br>[Xe] 5d <sup>1</sup> 6s <sup>2</sup>   | <b>58</b><br>Cerium<br><b>Ce</b><br>140.116<br>798<br>3257<br>1.1<br>6.77<br>3,4<br>[Xe] 4f <sup>2</sup> 6s <sup>2</sup>     | <b>59</b><br>Praseodymium<br><b>Pr</b><br>140.908<br>931<br>3017<br>1.1<br>6.48<br>3,4<br>[Xe] 4f <sup>3</sup> 6s <sup>2</sup>                    | <b>60</b><br>Neodymium<br><b>Nd</b><br>144.24<br>1010<br>3127<br>1.1<br>7.00<br>3<br>[Xe] 4f <sup>4</sup> 6s <sup>2</sup>                         | <b>61</b><br>Promethium<br><b>Pm</b><br>*146.915<br>1080<br>2730<br>1.1<br>7.22<br>3<br>[Xe] 4f <sup>6</sup> 6s <sup>2</sup>                      | <b>62</b><br>Samarium<br><b>Sm</b><br>150.36<br>1072<br>1900<br>1.1<br>7.22<br>2,3<br>[Xe] 4f <sup>6</sup> 6s <sup>2</sup>          | <b>63</b><br>Europium<br><b>Eu</b><br>151.964<br>822<br>1439<br>1.1<br>7.89<br>2,3<br>[Xe] 4f <sup>7</sup> 6s <sup>2</sup>           | <b>64</b><br>Gadolinium<br><b>Gd</b><br>157.25<br>1311<br>3000<br>1.1<br>7.89<br>2,3<br>[Xe] 4f <sup>7</sup> 5d <sup>1</sup> 6s <sup>2</sup> | <b>65</b><br>Terbium<br><b>Tb</b><br>158.925<br>1360<br>2480<br>1.1<br>8.25<br>3,4<br>[Xe] 4f <sup>9</sup> 6s <sup>2</sup>  | <b>66</b><br>Dysprosium<br><b>Dy</b><br>162.50<br>1409<br>2335<br>1.1<br>8.56<br>3,4<br>[Xe] 4f <sup>10</sup> 6s <sup>2</sup> | <b>67</b><br>Holmium<br><b>Ho</b><br>164.930<br>1470<br>2720<br>1.1<br>8.78<br>3,4<br>[Xe] 4f <sup>11</sup> 6s <sup>2</sup> | <b>68</b><br>Erbium<br><b>Er</b><br>167.259<br>1522<br>2510<br>1.1<br>9.05<br>3,4<br>[Xe] 4f <sup>12</sup> 6s <sup>2</sup> | <b>69</b><br>Thulium<br><b>Tm</b><br>168.934<br>1545<br>1725<br>1.1<br>9.32<br>3,4<br>[Xe] 4f <sup>13</sup> 6s <sup>2</sup> | <b>70</b><br>Ytterbium<br><b>Yb</b><br>173.04<br>824<br>1193<br>1.1<br>6.97<br>2,3<br>[Xe] 4f <sup>14</sup> 6s <sup>2</sup> | <b>71</b><br>Lutetium<br><b>Lu</b><br>174.967<br>1656<br>3315<br>1.1<br>9.84<br>3<br>[Xe] 4f <sup>14</sup> 5d <sup>1</sup> 6s <sup>2</sup> |
| <b>Actinides</b>  |  |   |   |   |   |  |  |   |   |   |  |   |   |  |
| <b>89</b><br>Actinium<br><b>Ac</b><br>*227.028<br>1050<br>3300<br>1.0<br>10.07<br>3<br>[Rn] 6d <sup>1</sup> 7s <sup>2</sup> | <b>90</b><br>Thorium<br><b>Th</b><br>*232.038<br>1750<br>(4800)<br>1.0<br>11.72<br>4<br>[Rn] 6d <sup>2</sup> 7s <sup>2</sup> | <b>91</b><br>Protactinium<br><b>Pa</b><br>*231.036<br>1554<br>(4200)<br>1.1<br>15.37<br>4<br>[Rn] 5f <sup>2</sup> 6d <sup>1</sup> 7s <sup>2</sup> | <b>92</b><br>Uranium<br><b>U</b><br>*238.029<br>1132<br>(3900)<br>1.2<br>18.97<br>3,4,5,6<br>[Rn] 5f <sup>3</sup> 6d <sup>1</sup> 7s <sup>2</sup> | <b>93</b><br>Neptunium<br><b>Np</b><br>*237.048<br>640<br>(3900)<br>1.2<br>19.74<br>3,4,6<br>[Rn] 5f <sup>4</sup> 6d <sup>1</sup> 7s <sup>2</sup> | <b>94</b><br>Plutonium<br><b>Pu</b><br>*244.048<br>641<br>(3200)<br>1.2<br>13.67<br>3,4,5,6<br>[Rn] 5f <sup>6</sup> 7s <sup>2</sup> | <b>95</b><br>Americium<br><b>Am</b><br>*243.061<br>944<br>(2600)<br>~1.2<br>13.51<br>3,4,5,6<br>[Rn] 5f <sup>7</sup> 7s <sup>2</sup> | <b>96</b><br>Curium<br><b>Cm</b><br>*247.070<br>1340<br>-<br>~1.2<br>13.51<br>3,4<br>[Rn] 5f <sup>8</sup> 7s <sup>2</sup>                    | <b>97</b><br>Berkelium<br><b>Bk</b><br>*247.070<br>986<br>-<br>~1.2<br>13.25<br>3,4<br>[Rn] 5f <sup>9</sup> 7s <sup>2</sup> | <b>98</b><br>Californium<br><b>Cf</b><br>*251.080<br>900<br>-<br>~1.2<br>15.1<br>3,4<br>[Rn] 5f <sup>10</sup> 7s <sup>2</sup> | <b>99</b><br>Einsteinium<br><b>Es</b><br>*252.083<br>-<br>-<br>~1.2<br>-<br>3<br>[Rn] 5f <sup>11</sup> 7s <sup>2</sup>      | <b>100</b><br>Fermium<br><b>Fm</b><br>*257.095<br>-<br>-<br>~1.2<br>-<br>3<br>[Rn] 5f <sup>12</sup> 7s <sup>2</sup>        | <b>101</b><br>Mendelevium<br><b>Md</b><br>*258.099<br>-<br>-<br>~1.2<br>-<br>3<br>[Rn] 5f <sup>13</sup> 7s <sup>2</sup>     | <b>102</b><br>Nobelium<br><b>No</b><br>*259.101<br>-<br>-<br>~1.2<br>-<br>2,3<br>[Rn] 5f <sup>14</sup> 7s <sup>2</sup>      | <b>103</b><br>Lawrencium<br><b>Lr</b><br>*262.110<br>-<br>-<br>~1.2<br>-<br>3<br>[Rn] 5f <sup>14</sup> 6d <sup>1</sup> 7s <sup>2</sup>     |

## Metal Basis

- Aluminium
- Ammonium
- Calcium
- Chromium
- Copper
- Iron
- Lithium
- Magnesium
- Manganese
- Molybdenum
- Potassium
- Selenium
- Sodium
- Strontium
- Zinc

## Available Salts

- Acetates
- Adipates
- Ascorbates
- Aspartates
- Benzoates
- Carbonates
- Chlorides
- Citrates
- Formates
- Fumarates
- Gluconates
- Glycerophosphates
- Hydroxides
- Lactates
- Malates
- Nitrates
- Oxalates
- Oxides
- Peptonates
- Peroxides
- Phosphates
- Propionates
- Pyrophosphates
- Saccharates
- Selenates
- Selenites
- Silicates
- Stearates
- Succinates
- Sulfates
- Tartrates
- others

## Physical Form

- Powder
- Fine Powder
- Micronized Powder
- Encapsulated Products
- Crystals
- Fine Granules
- Granules
- Compacted Products

## Our Competence

- A wide range of mineral salts
- Extensive experience in mineral salt production since 1886
- Development of new forms of products in partnership with customers
- GMP and DIN EN ISO 9001 certified production sites
- Consistent and homogeneous product qualities – (Pharmacopoeia, Food Chemicals Codex, EC Food Regulations, customer specifications)
- Application assistance can be provided
- Product modifications and customer orientated adaptations with respect to:
  - Physical product properties
    - Milling
    - Micronizing
    - Sieving
    - Compacting
    - Granulating
    - Blending
    - Flowability
    - Bulk Density Variation
  - Chemical product properties
    - Purities
    - pH-Value
    - Concentrations
    - Microencapsulation
- Packaging and labelling according to your request

## Granulated Mineral Salts

- Calcium Acetate
- Calcium Propionate
- Potassium Acetate
- Sodium Acetate

## Mineral Salts DC

- Calcium Carbonate M-Types
- Calcium Carbonate P-Types
- Calcium Carbonate S-Types
- Tricalcium Citrate
- Ferrous Fumarate
- Magnesium Carbonate S-Types
- Magnesium Hydroxide
- Magnesium Trisilicate

## Microencapsulated Mineral Salts

- Copper(II) Sulfate ET 50%
- Ferrous Fumarate E 60%
- Ferrous Fumarate ET 50%
- Ferrous Sulfate E 50%
- Ferrous Sulfate ET 50%
- Ferrous Sulfate SE 50%

## Micronized Mineral Salts

- Calcium Carbonate
- Tricalcium Citrate
- Ferrous Fumarate
- Ferrous Gluconate
- Ferrous Sulfate, dried
- Ferric Pyrophosphate
- Trimagnesium Dicitrate
- Magnesium Glycerophosphate
- Sodium Benzoate
- Sodium Bicarbonate
- Monosodium Citrate
- Zinc Citrate
- Zinc Sulfate