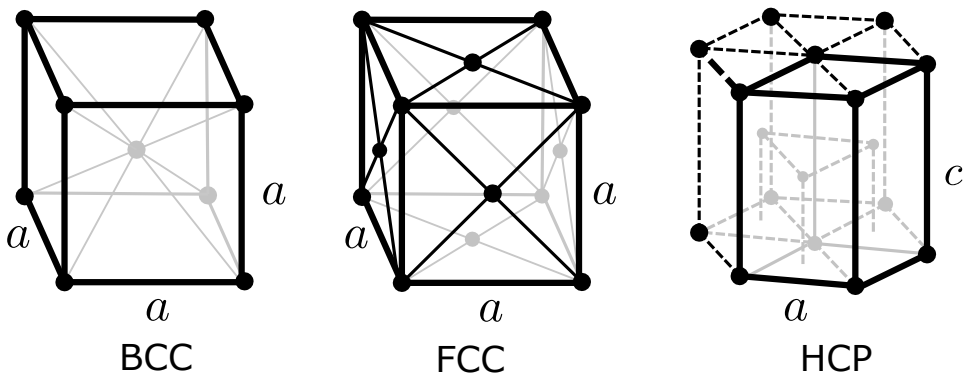


# Periodic Table for Solid State Physics

- FCC – Face-Centered Cubic  
BCC – Body-Centered Cubic  
SC – Simple Cubic  
CUB – Cubic  
TET – Tetragonal
- ORC – Orthorhombic  
HCP – Hexagonal closed-packed  
DIA – Diamond  
RHL – Rhombohedral  
MCL – Monoclinic



| 13 IIIA                                                                                                                         | 14 IVA                                                                                                                | 15 VA                                                                                                                         | 16 VIA                                                                                                                 | 17 VIIA                                                                                                              | 18 VIIIA                                                                                                             |
|---------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| 5<br>B<br>Boron<br>[He]2s <sup>2</sup> 2p <sup>1</sup><br>5.06 RHL 58.1°<br>2348 2.46 1250                                      | 6<br>C<br>Carbon<br>[He]2s <sup>2</sup> 2p <sup>2</sup><br>2.46 HCP 2.723<br>3915 2.26 1860                           | 7<br>N<br>Nitrogen<br>[He]2s <sup>2</sup> 2p <sup>3</sup><br>3.86 HCP 1.622<br>63.3 1.25 79                                   | 8<br>O<br>Oxygen<br>[He]2s <sup>2</sup> 2p <sup>4</sup><br>5.40 MCL 133°<br>55 1.43 46                                 | 9<br>F<br>Flourine<br>[He]2s <sup>2</sup> 2p <sup>5</sup><br>5.50 ORC 1.323<br>53 1.696                              | 10<br>Ne<br>Neon<br>[He]2s <sup>2</sup> 2p <sup>6</sup><br>4.43 FCC<br>25 0.90 63                                    |
| 13<br>Al<br>Aluminium<br>[Ne]3s <sup>2</sup> 3p <sup>1</sup><br>4.05 FCC<br>933 2.70 394                                        | 14<br>Si<br>Silicon<br>[Ne]3s <sup>2</sup> 3p <sup>2</sup><br>5.43 DIA<br>1687 2.33 625                               | 15<br>P<br>Phosphorus<br>[Ne]3s <sup>2</sup> 3p <sup>3</sup><br>3.36 ORC 3.324<br>317 1.823                                   | 16<br>S<br>Sulphur<br>[Ne]3s <sup>2</sup> 3p <sup>4</sup><br>10.4 ORC 2.335<br>388 1.96                                | 17<br>Cl<br>Chlorine<br>[Ne]3s <sup>2</sup> 3p <sup>5</sup><br>6.22 ORC 1.314<br>172 3.214                           | 18<br>Ar<br>Argon<br>[Ne]3s <sup>2</sup> 3p <sup>6</sup><br>5.26 FCC<br>84 1.78 85                                   |
| 31<br>Ga<br>Gallium<br>[Ne]3d <sup>10</sup> 4s <sup>2</sup> 4p <sup>1</sup><br>4.51 ORC 1.001<br>303 5.91 240                   | 32<br>Ge<br>Germanium<br>[Ar]3d <sup>10</sup> 4s <sup>2</sup> 4p <sup>2</sup><br>5.66 DIA<br>1211 5.32 360            | 33<br>As<br>Arsenic<br>[Ar]3d <sup>10</sup> 4s <sup>2</sup> 4p <sup>3</sup><br>3.76 RHL 2.805<br>1090 5.73 285                | 34<br>Se<br>Selenium<br>[Ar]3d <sup>10</sup> 4s <sup>2</sup> 4p <sup>4</sup><br>9.08 MCL 90.8°<br>494 4.82 150         | 35<br>Br<br>Bromine<br>[Ar]3d <sup>10</sup> 4s <sup>2</sup> 4p <sup>5</sup><br>6.73 ORC 1.294<br>266 3.12            | 36<br>Kr<br>Krypton<br>[Ar]3d <sup>10</sup> 4s <sup>2</sup> 4p <sup>6</sup><br>5.71 FCC<br>116 3.75 73               |
| 49<br>In<br>Indium<br>[Kr]4d <sup>10</sup> 5s <sup>2</sup> 5p <sup>1</sup><br>3.25 TET 1.521<br>430 7.31 129                    | 50<br>Sn<br>Tin<br>[Kr]4d <sup>10</sup> 5s <sup>2</sup> 5p <sup>2</sup><br>5.83 TET 0.546<br>505 7.31 170             | 51<br>Sb<br>Antimony<br>[Kr]4d <sup>10</sup> 5s <sup>2</sup> 5p <sup>3</sup><br>4.30 RHL 2.617<br>904 6.70 200                | 52<br>Te<br>Tellurium<br>[Kr]4d <sup>10</sup> 5s <sup>2</sup> 5p <sup>4</sup><br>4.45 HCP 1.330<br>723 6.24 139        | 53<br>I<br>Iodine<br>[Kr]4d <sup>10</sup> 5s <sup>2</sup> 5p <sup>5</sup><br>7.18 ORC 1.366<br>387 4.93              | 54<br>Xe<br>Xenon<br>[Kr]4d <sup>10</sup> 5s <sup>2</sup> 5p <sup>6</sup><br>6.20 FCC<br>161 5.89 55                 |
| 81<br>Tl<br>Thallium<br>[Xe]4f <sup>14</sup> 5d <sup>10</sup> 6s <sup>2</sup> 6p <sup>1</sup><br>3.46 HCP 1.599<br>577 11.85 96 | 82<br>Pb<br>Lead<br>[Xe]4f <sup>14</sup> 5d <sup>10</sup> 6s <sup>2</sup> 6p <sup>2</sup><br>4.95 FCC<br>601 11.34 68 | 83<br>Bi<br>Bismuth<br>[Xe]4f <sup>14</sup> 5d <sup>10</sup> 6s <sup>2</sup> 6p <sup>3</sup><br>6.67 MCL 110°<br>544 97.8 120 | 84<br>Po<br>Polonium<br>[Xe]4f <sup>14</sup> 5d <sup>10</sup> 6s <sup>2</sup> 6p <sup>4</sup><br>3.36 SC<br>527 9.20   | 85<br>At<br>Astatine<br>[Xe]4f <sup>14</sup> 5d <sup>10</sup> 6s <sup>2</sup> 6p <sup>5</sup><br>FCC<br>575 6.35     | 86<br>Rn<br>Radon<br>[Xe]4f <sup>14</sup> 5d <sup>10</sup> 6s <sup>2</sup> 6p <sup>6</sup><br>FCC<br>202 9.73        |
| 113<br>Nh<br>Nihonium<br>[Rn]5f <sup>14</sup> 6d <sup>10</sup> 7s <sup>2</sup> 7p <sup>1</sup><br>9.5 s<br>700 16               | 114<br>Fl<br>Flerovium<br>[Rn]5f <sup>14</sup> 6d <sup>10</sup> 7s <sup>2</sup> 7p <sup>2</sup><br>2 s<br>200 9.93    | 115<br>Mc<br>Moscovium<br>[Rn]5f <sup>14</sup> 6d <sup>10</sup> 7s <sup>2</sup> 7p <sup>3</sup><br>650 ms<br>670 13.5         | 116<br>Lv<br>Livermorium<br>[Rn]5f <sup>14</sup> 6d <sup>10</sup> 7s <sup>2</sup> 7p <sup>4</sup><br>57 ms<br>709 12.9 | 117<br>Ts<br>Tennessine<br>[Rn]5f <sup>14</sup> 6d <sup>10</sup> 7s <sup>2</sup> 7p <sup>5</sup><br>51 ms<br>700 7.2 | 118<br>Og<br>Oganesson<br>[Rn]5f <sup>14</sup> 6d <sup>10</sup> 7s <sup>2</sup> 7p <sup>6</sup><br>690 μs<br>325 6.6 |

- Alkali Metal

Alkaline Earth Metal

Metal

Metalloid

Non-metal

Halogen

Noble Gas

Lanthanide/Actinide
- Radioactive

$t_{1/2}$

$\alpha$ : Angle between axes (°)

$a$ : Lattice constant (Å)

$b/a$ ,  $c/a$ ,  $c/a$ : HEX/ORC/RHL ratios

$\rho$ : Density (g/cc)

$T_m$ : Melting Temperature (K)

$T_D$ : Debye Temperature (K)

|             |          |
|-------------|----------|
| Z           | mass     |
| Symbol      |          |
| Name        |          |
| Elec. Conf. | $\alpha$ |
| Lattice     | $b/a$    |
| $a$         | $c/a$    |
| $T_m$       | $T_D$    |
| $\rho$      |          |

man-made

|                                                                                                 |                                                                                                              |                                                                                                                    |                                                                                                                 |                                                                                                                 |                                                                                                                |                                                                                                              |                                                                                                                  |                                                                                                               |                                                                                                                   |                                                                                                                |                                                                                                               |                                                                                                                |                                                                                                            |                                                                                                                 |
|-------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| 57<br>La<br>Lanthanum<br>[Xe]5d <sup>1</sup> 6s <sup>2</sup><br>3.77 HCP 1.619<br>1193 6.17 132 | 58<br>Ce<br>Cerium<br>[Xe]4f <sup>1</sup> 5d <sup>1</sup> 6s <sup>2</sup><br>3.65 HCP 1.633<br>1071 6.77 139 | 59<br>Pr<br>Praseodymium<br>[Xe]4f <sup>3</sup> 5d <sup>0</sup> 6s <sup>2</sup><br>3.67 HCP 3.222<br>2104 6.77 152 | 60<br>Nd<br>Neodymium<br>[Xe]4f <sup>4</sup> 5d <sup>0</sup> 6s <sup>2</sup><br>3.66 HCP 3.226<br>1294 7.01 157 | 61<br>Pm<br>Promethium<br>[Xe]4f <sup>5</sup> 5d <sup>0</sup> 6s <sup>2</sup><br>dHCP<br>1373 7.26              | 62<br>Sm<br>Samarium<br>[Xe]4f <sup>6</sup> 5d <sup>0</sup> 6s <sup>2</sup><br>3.62 RHL 7.249<br>1345 7.54 166 | 63<br>Eu<br>Europium<br>[Xe]4f <sup>7</sup> 5d <sup>0</sup> 6s <sup>2</sup><br>4.58 BCC<br>1095 5.26 107     | 64<br>Gd<br>Gadolinium<br>[Xe]4f <sup>7</sup> 5d <sup>1</sup> 6s <sup>2</sup><br>3.64 HCP 1.590<br>1585 8.23 176 | 65<br>Tb<br>Terbium<br>[Xe]4f <sup>9</sup> 5d <sup>0</sup> 6s <sup>2</sup><br>3.60 HCP 1.581<br>1629 8.22 188 | 66<br>Dy<br>Dysprosium<br>[Xe]4f <sup>10</sup> 5d <sup>0</sup> 6s <sup>2</sup><br>3.59 HCP 1.573<br>1685 8.55 188 | 67<br>Ho<br>Holmium<br>[Xe]4f <sup>11</sup> 5d <sup>0</sup> 6s <sup>2</sup><br>3.58 HCP 1.569<br>1747 8.80 191 | 68<br>Er<br>Erbium<br>[Xe]4f <sup>12</sup> 5d <sup>0</sup> 6s <sup>2</sup><br>3.56 HCP 1.570<br>1802 9.07 195 | 69<br>Tm<br>Thulium<br>[Xe]4f <sup>13</sup> 5d <sup>0</sup> 6s <sup>2</sup><br>3.54 HCP 1.570<br>1818 9.32 200 | 70<br>Yb<br>Ytterbium<br>[Xe]4f <sup>14</sup> 5d <sup>0</sup> 6s <sup>2</sup><br>5.49 FCC<br>1092 6.97 118 | 71<br>Lu<br>Lutetium<br>[Xe]4f <sup>14</sup> 5d <sup>1</sup> 6s <sup>2</sup><br>3.50 HCP 1.585<br>1936 9.84 207 |
| 89<br>Ac<br>Actinium<br>[Rn]6d <sup>1</sup> 7s <sup>2</sup><br>5.67 FCC<br>1323 10.07           | 90<br>Th<br>Thorium<br>[Rn]6d <sup>2</sup> 7s <sup>2</sup><br>5.08 FCC<br>2023 11.72 100                     | 91<br>Pa<br>Protactinium<br>[Rn]5f <sup>2</sup> 6d <sup>1</sup> 7s <sup>2</sup><br>3.92 TET 0.825<br>1845 15.37    | 92<br>U<br>Uranium<br>[Rn]5f <sup>3</sup> 6d <sup>1</sup> 7s <sup>2</sup><br>2.85 ORC 1.736<br>1408 19.05 210   | 93<br>Np<br>Neptunium<br>[Rn]5f <sup>4</sup> 6d <sup>1</sup> 7s <sup>2</sup><br>6.66 ORC 0.733<br>917 20.45 188 | 94<br>Pu<br>Plutonium<br>[Rn]5f <sup>6</sup> 6d <sup>0</sup> 7s <sup>2</sup><br>6.18 MCL 1.733<br>914          | 95<br>Am<br>Americium<br>[Rn]5f <sup>7</sup> 6d <sup>0</sup> 7s <sup>2</sup><br>3.46 HCP 3.241<br>1449 13.67 | 96<br>Cm<br>Curium<br>[Rn]5f <sup>7</sup> 6d <sup>1</sup> 7s <sup>2</sup><br>3.50 HCP 3.241<br>1618 13.51        | 97<br>Bk<br>Berkelium<br>[Rn]5f <sup>9</sup> 6d <sup>0</sup> 7s <sup>2</sup><br>3.41 HCP 3.240<br>1323 14.78  | 98<br>Cf<br>Californium<br>[Rn]5f <sup>10</sup> 6d <sup>0</sup> 7s <sup>2</sup><br>3.38 HCP 3.262<br>1173 15.10   | 99<br>Es<br>Einsteinium<br>[Rn]5f <sup>11</sup> 6d <sup>0</sup> 7s <sup>2</sup><br>FCC<br>1133 8.84            | 100<br>Fm<br>Fermium<br>[Rn]5f <sup>12</sup> 6d <sup>0</sup> 7s <sup>2</sup><br>FCC<br>1800 9.7               | 101<br>Md<br>Mendelevium<br>[Rn]5f <sup>13</sup> 6d <sup>0</sup> 7s <sup>2</sup><br>FCC<br>1100 10.3           | 102<br>No<br>Nobelium<br>[Rn]5f <sup>14</sup> 6d <sup>0</sup> 7s <sup>2</sup><br>FCC<br>1100 9.9           | 103<br>Lr<br>Lawrencium<br>[Rn]5f <sup>14</sup> 7s <sup>2</sup> 7p <sup>1</sup><br>HCP<br>1900 14.4             |