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<table border="1"> <tr> <td colspan="2">The Active Metals</td> <td colspan="16">The Nonmetals</td> <td colspan="1">Noble Gases</td> </tr> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td> </tr> <tr> <td>H</td><td>He</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>1.008</td><td>4.003</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>3</td><td>4</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>Li</td><td>Be</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>6.941</td><td>9.012</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>11</td><td>12</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>Na</td><td>Mg</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>22.990</td><td>24.305</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> 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<td>Rb</td><td>Sr</td><td>Y</td><td>Zr</td><td>Nb</td><td>Mo</td><td>Tc</td><td>Ru</td><td>Rh</td><td>Pd</td><td>Ag</td><td>Cd</td><td>In</td><td>Sn</td><td>Sb</td><td>Te</td><td>I</td><td>Xe</td> </tr> <tr> <td>85.468</td><td>87.62</td><td>88.906</td><td>91.224</td><td>92.906</td><td>95.94</td><td>(98)</td><td>101.07</td><td>102.906</td><td>106.42</td><td>107.868</td><td>112.41</td><td>114.82</td><td>118.69</td><td>121.75</td><td>127.60</td><td>126.904</td><td>131.29</td> </tr> <tr> <td>55</td><td>56</td><td>57</td><td>* 72</td><td>73</td><td>74</td><td>75</td><td>76</td><td>77</td><td>78</td><td>79</td><td>80</td><td>81</td><td>82</td><td>83</td><td>84</td><td>85</td><td>86</td> </tr> <tr> <td>Cs</td><td>Ba</td><td>La</td><td>Hf</td><td>Ta</td><td>W</td><td>Re</td><td>Os</td><td>Ir</td><td>Pt</td><td>Au</td><td>Hg</td><td>Tl</td><td>Pb</td><td>Bi</td><td>Po</td><td>At</td><td>Rn</td> </tr> <tr> <td>132.905</td><td>137.33</td><td>138.905</td><td>178.49</td><td>180.948</td><td>183.85</td><td>186.21</td><td>190.2</td><td>192.22</td><td>195.08</td><td>196.966</td><td>200.59</td><td>204.38</td><td>207.2</td><td>208.98</td><td>(209)</td><td>(210)</td><td>(222)</td> </tr> <tr> <td>87</td><td>88</td><td>89</td><td>† 104</td><td>105</td><td>106</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>Fr</td><td>Ra</td><td>Ac</td><td>Unq</td><td>Ump</td><td>Unh</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>(223)</td><td>226.025</td><td>227.028</td><td>(261)</td><td>(262)</td><td>(263)</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </table>																		The Active Metals		The Nonmetals																Noble 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39.098	40.08	44.956	47.88	50.942	51.996	54.938	55.847	58.933	58.69	63.546	65.38	69.72	72.59	74.922	78.96	79.904	83.80																																																																																																																																																																																																																																																																																																																																																																																																													
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85.468	87.62	88.906	91.224	92.906	95.94	(98)	101.07	102.906	106.42	107.868	112.41	114.82	118.69	121.75	127.60	126.904	131.29																																																																																																																																																																																																																																																																																																																																																																																																													
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132.905	137.33	138.905	178.49	180.948	183.85	186.21	190.2	192.22	195.08	196.966	200.59	204.38	207.2	208.98	(209)	(210)	(222)																																																																																																																																																																																																																																																																																																																																																																																																													
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<table border="1"> <tr> <td colspan="18">Inner Transition Metals</td> </tr> <tr> <td>58</td><td>59</td><td>60</td><td>61</td><td>62</td><td>63</td><td>64</td><td>65</td><td>66</td><td>67</td><td>68</td><td>69</td><td>70</td><td>71</td> </tr> <tr> <td>Ce</td><td>Pr</td><td>Nd</td><td>Pm</td><td>Sm</td><td>Eu</td><td>Gd</td><td>Tb</td><td>Dy</td><td>Ho</td><td>Er</td><td>Tm</td><td>Yb</td><td>Lu</td> </tr> <tr> <td>140.12</td><td>140.908</td><td>144.24</td><td>(145)</td><td>150.36</td><td>151.96</td><td>157.25</td><td>158.925</td><td>162.50</td><td>164.930</td><td>167.26</td><td>168.934</td><td>173.04</td><td>174.967</td> </tr> <tr> <td>90</td><td>91</td><td>92</td><td>93</td><td>94</td><td>95</td><td>96</td><td>97</td><td>98</td><td>99</td><td>100</td><td>101</td><td>102</td><td>103</td> </tr> <tr> <td>Th</td><td>Pa</td><td>U</td><td>Np</td><td>Pu</td><td>Am</td><td>Cm</td><td>Bk</td><td>Cf</td><td>Es</td><td>Fm</td><td>Md</td><td>No</td><td>Lr</td> </tr> <tr> <td>232.038</td><td>231.036</td><td>238.029</td><td>237.048</td><td>(244)</td><td>(243)</td><td>(247)</td><td>(247)</td><td>(251)</td><td>(252)</td><td>(257)</td><td>(258)</td><td>(259)</td><td>(260)</td> </tr> </table>																		Inner Transition Metals																		58	59	60	61	62	63	64	65	66	67	68	69	70	71	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	140.12	140.908	144.24	(145)	150.36	151.96	157.25	158.925	162.50	164.930	167.26	168.934	173.04	174.967	90	91	92	93	94	95	96	97	98	99	100	101	102	103	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr	232.038	231.036	238.029	237.048	(244)	(243)	(247)	(247)	(251)	(252)	(257)	(258)	(259)	(260)																																																																																																																																																																																																																																																																																																							
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$$c = 2.9979 \times 10^8 \text{ m/s}$$

$$h = 6.6261 \times 10^{-34} \text{ J s}$$

$$N_A = 6.022 \times 10^{23} \text{ mol}^{-1}$$

$$m_e = 9.1094 \times 10^{-31} \text{ kg}$$

$$a_0 = 5.292 \times 10^{-11} \text{ m}$$

$$1 \text{ amu} = 1.66 \times 10^{-27} \text{ kg}$$

$$\lambda = \frac{h}{p}$$

$$R_H = 2.1799 \times 10^{-18} \text{ J}$$

$$\mathfrak{R} = R_H/h = 3.2898 \times 10^{15} \text{ Hz}$$

$$E_n = \frac{p^2}{2m}$$

$$E_n = -\frac{Z^2 R_H}{n^2}$$

$$E_{nl} = -\frac{Z_{\text{eff}}^2 R_H}{n^2}$$

$$1 \text{ W} = 1 \text{ J s}^{-1}$$

$$1 \text{ J} = 1 \text{ kg m}^2 \text{ s}^{-2}$$

$$1 \text{ eV} = 1.6022 \times 10^{-19} \text{ J}$$

for s wavefunction:

$$\text{RPD} = 4\pi r^2 \Psi^2 dr$$

for $n_f < n_i, \dots$

$$v = \frac{Z^2 R_H}{h} \left(\frac{1}{n_f^2} - \frac{1}{n_i^2} \right)$$

for $n_f > n_i, \dots$

$$v = \frac{Z^2 R_H}{h} \left(\frac{1}{n_i^2} - \frac{1}{n_f^2} \right)$$