
### Aluminum

<table>
<thead>
<tr>
<th>Substance</th>
<th>Δ(H^\circ) (kJ/mol)</th>
<th>Δ(G^\circ) (kJ/mol)</th>
<th>(S^\circ) (J/mol K)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Al(s)</td>
<td>0.0</td>
<td>0.0</td>
<td>28.3</td>
</tr>
<tr>
<td>Al(g)</td>
<td>330.0</td>
<td>289.4</td>
<td>164.6</td>
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<tr>
<td>AlCl(_3)(s)</td>
<td>−704.2</td>
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<tr>
<td>Al(_2)O(_3)(s)</td>
<td>−1675.7</td>
<td>−1582.3</td>
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### Barium

<table>
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<th>Substance</th>
<th>Δ(H^\circ) (kJ/mol)</th>
<th>Δ(G^\circ) (kJ/mol)</th>
<th>(S^\circ) (J/mol K)</th>
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<tbody>
<tr>
<td>Ba(s)</td>
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<td>Ba(g)</td>
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<td>BaSO(_4)(s)</td>
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### Beryllium

<table>
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<tr>
<th>Substance</th>
<th>Δ(H^\circ) (kJ/mol)</th>
<th>Δ(G^\circ) (kJ/mol)</th>
<th>(S^\circ) (J/mol K)</th>
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<td>Be(s)</td>
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<td>0.0</td>
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<td>Be(g)</td>
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<td>BeO(s)</td>
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### Bismuth

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<th>Substance</th>
<th>Δ(H^\circ) (kJ/mol)</th>
<th>Δ(G^\circ) (kJ/mol)</th>
<th>(S^\circ) (J/mol K)</th>
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<tr>
<td>Bi(s)</td>
<td>0.0</td>
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<td>Bi(g)</td>
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### Bromine

<table>
<thead>
<tr>
<th>Substance</th>
<th>$\Delta H_f^\circ$ (kJ/mol)</th>
<th>$\Delta G_f^\circ$ (kJ/mol)</th>
<th>$S^\circ$ (J/mol K)</th>
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<tbody>
<tr>
<td>Br(g)</td>
<td>111.9</td>
<td>82.4</td>
<td>175.0</td>
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<td>Br$_2$(l)</td>
<td>0.0</td>
<td>0.0</td>
<td>152.2</td>
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<tr>
<td>Br$^-$ (aq)</td>
<td>$-121.6$</td>
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<td>Br$_2$(g)</td>
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<td>HBr(g)</td>
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<td>$-121.6$</td>
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### Cadmium

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<tr>
<th>Substance</th>
<th>$\Delta H_f^\circ$ (kJ/mol)</th>
<th>$\Delta G_f^\circ$ (kJ/mol)</th>
<th>$S^\circ$ (J/mol K)</th>
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<td>Cd(g)</td>
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<td>CdCl$_2$(s)</td>
<td>$-391.5$</td>
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<td>CdS(s)</td>
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<td>64.9</td>
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### Calcium

<table>
<thead>
<tr>
<th>Substance</th>
<th>$\Delta H_f^\circ$ (kJ/mol)</th>
<th>$\Delta G_f^\circ$ (kJ/mol)</th>
<th>$S^\circ$ (J/mol K)</th>
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<td>Ca(s)</td>
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<td>0.0</td>
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<td>Ca(g)</td>
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<tr>
<td>CaCl$_2$(s)</td>
<td>$-795.4$</td>
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<td>CaF$_2$(s)</td>
<td>$-1228.0$</td>
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<td>Ca(OH)$_2$(s)</td>
<td>$-985.2$</td>
<td>$-897.5$</td>
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<td>CaO(s)</td>
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<td>CaSO$_4$(s)</td>
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<td>$\Delta G^\circ$ (kJ/mol)</td>
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<tr>
<td>C(s, graphite)</td>
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<td>C(s, diamond)</td>
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<td>C(s, fullerene—C$_{60}$)</td>
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<td>CH$_3$OH(g)</td>
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<td>239.9</td>
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<tr>
<td>Substance</td>
<td>$\Delta H_f^\circ$ (kJ/mol)</td>
<td>$\Delta G_f^\circ$ (kJ/mol)</td>
<td>$S^\circ$ (J/mol K)</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>-----------------------------</td>
<td>-----------------------------</td>
<td>-------------------</td>
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<td>C$_6$H$_6$(g)</td>
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<td>C$_2$H$_5$OH(g)</td>
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<td>−167.9</td>
<td>281.6</td>
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<tr>
<td>(CH$_3$)$_2$O(l)</td>
<td>−203.3</td>
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<td>(CH$_3$)$_2$O(g)</td>
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Cesium

<table>
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<tr>
<th>Substance</th>
<th>$\Delta H_f^\circ$ (kJ/mol)</th>
<th>$\Delta G_f^\circ$ (kJ/mol)</th>
<th>$S^\circ$ (J/mol K)</th>
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<tbody>
<tr>
<td>Substance</td>
<td>Δ(H^\circ) (kJ/mol)</td>
<td>Δ(G^\circ) (kJ/mol)</td>
<td>S° (J/mol K)</td>
</tr>
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<td>Cs(s)</td>
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<td>CsCl(s)</td>
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**Chlorine**

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<th>Substance</th>
<th>Δ(H^\circ) (kJ/mol)</th>
<th>Δ(G^\circ) (kJ/mol)</th>
<th>S° (J/mol K)</th>
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<tbody>
<tr>
<td>Cl(g)</td>
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<td>HCl(aq)</td>
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<td>Cl(_3)F(g)</td>
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<td>281.6</td>
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**Chromium**

<table>
<thead>
<tr>
<th>Substance</th>
<th>Δ(H^\circ) (kJ/mol)</th>
<th>Δ(G^\circ) (kJ/mol)</th>
<th>S° (J/mol K)</th>
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<td>Cr(s)</td>
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<td>Cr(g)</td>
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<td>CrCl(_3)(s)</td>
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<td>CrO(_3)(g)</td>
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<tr>
<td>Cr(_2)O(_3)(s)</td>
<td>−1139.7</td>
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<td>81.2</td>
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**Cobalt**

<table>
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<tr>
<th>Substance</th>
<th>Δ(H^\circ) (kJ/mol)</th>
<th>Δ(G^\circ) (kJ/mol)</th>
<th>S° (J/mol K)</th>
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<tr>
<td>Co(s)</td>
<td>0.0</td>
<td>0.0</td>
<td>30.0</td>
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<td>Co(g)</td>
<td>424.7</td>
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<td>CoCl(_2)(s)</td>
<td>−312.5</td>
<td>−269.8</td>
<td>109.2</td>
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**Copper**

<table>
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<th>Δ(G^\circ) (kJ/mol)</th>
<th>S° (J/mol K)</th>
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<tbody>
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<td>Substance</td>
<td>( \Delta H^\circ ) (kJ/mol)</td>
<td>( \Delta G^\circ ) (kJ/mol)</td>
<td>( S^\circ ) (J/mol K)</td>
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<td>-----------------</td>
<td>-----------------</td>
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<tr>
<td>Cu(s)</td>
<td>0.0</td>
<td>0.0</td>
<td>33.2</td>
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<tr>
<td>Cu(g)</td>
<td>337.4</td>
<td>297.7</td>
<td>166.4</td>
</tr>
<tr>
<td>CuCl(s)</td>
<td>-137.2</td>
<td>-119.9</td>
<td>86.2</td>
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<td>CuCl_2(s)</td>
<td>-220.1</td>
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<td>108.1</td>
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<td>CuO(s)</td>
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<td>42.6</td>
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<td>Cu_2O(s)</td>
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<td>66.5</td>
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<td>Cu_2S(s)</td>
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<tr>
<td>CuCN(s)</td>
<td>96.2</td>
<td>111.3</td>
<td>84.5</td>
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**Fluorine**

<table>
<thead>
<tr>
<th>Substance</th>
<th>( \Delta H^\circ ) (kJ/mol)</th>
<th>( \Delta G^\circ ) (kJ/mol)</th>
<th>( S^\circ ) (J/mol K)</th>
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<tbody>
<tr>
<td>F(g)</td>
<td>79.4</td>
<td>62.3</td>
<td>158.8</td>
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<tr>
<td>F^-(aq)</td>
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**Hydrogen**

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**Iodine**

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**Lead**

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### Lithium

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### Magnesium

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### Manganese

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<td>$POCl_3(g)$</td>
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**Potassium**

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<th>$\Delta G_f^\circ$ (kJ/mol)</th>
<th>$S^\circ$ (J/mol K)</th>
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**Rubidium**

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<th>$\Delta G_f^\circ$ (kJ/mol)</th>
<th>$S^\circ$ (J/mol K)</th>
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<tbody>
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<td>$\Delta H_f^\circ$ (kJ/mol)</td>
<td>$\Delta G_f^\circ$ (kJ/mol)</td>
<td>$S^\circ$ (J/mol K)</td>
</tr>
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**Selenium**

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<th>$\Delta G_f^\circ$ (kJ/mol)</th>
<th>$S^\circ$ (J/mol K)</th>
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**Silicon**

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<th>$\Delta G_f^\circ$ (kJ/mol)</th>
<th>$S^\circ$ (J/mol K)</th>
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**Silver**

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<th>$\Delta G_f^\circ$ (kJ/mol)</th>
<th>$S^\circ$ (J/mol K)</th>
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### Sodium

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<th>$S^\circ$ (J/mol K)</th>
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### Sulfur

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<td>$\Delta G_f^\circ$ (kJ/mol)</td>
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**Tin**

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<th>$\Delta G_f^\circ$ (kJ/mol)</th>
<th>$S^\circ$ (J/mol K)</th>
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**Titanium**

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<table>
<thead>
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<th>$\Delta H_f^\circ$ (kJ/mol)</th>
<th>$\Delta G_f^\circ$ (kJ/mol)</th>
<th>$S^\circ$ (J/mol K)</th>
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<td>—</td>
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$\text{ZnSO}_4(s)$:  \(-982.8\) \hspace{1cm} \(-871.5\) \hspace{1cm} 110.5