Top of Form

Bottom of Form

**Selected Thermodynamic Data at 298.15 Kelvin**

[Aluminum](https://owl.cengage.com/departments/GenChemZumdahl8eAPDemo0312/appendix/thermodynamic.html#Aluminum), [Barium](https://owl.cengage.com/departments/GenChemZumdahl8eAPDemo0312/appendix/thermodynamic.html#Barium), [Beryllium](https://owl.cengage.com/departments/GenChemZumdahl8eAPDemo0312/appendix/thermodynamic.html#Beryllium), [Bromine](https://owl.cengage.com/departments/GenChemZumdahl8eAPDemo0312/appendix/thermodynamic.html#Bromine), [Cadmium](https://owl.cengage.com/departments/GenChemZumdahl8eAPDemo0312/appendix/thermodynamic.html#Cadmium), [Calcium](https://owl.cengage.com/departments/GenChemZumdahl8eAPDemo0312/appendix/thermodynamic.html#Calcium), [Carbon](https://owl.cengage.com/departments/GenChemZumdahl8eAPDemo0312/appendix/thermodynamic.html#Carbon), [Chlorine](https://owl.cengage.com/departments/GenChemZumdahl8eAPDemo0312/appendix/thermodynamic.html#Chlorine), [Chromium](https://owl.cengage.com/departments/GenChemZumdahl8eAPDemo0312/appendix/thermodynamic.html#Chromium),[Copper](https://owl.cengage.com/departments/GenChemZumdahl8eAPDemo0312/appendix/thermodynamic.html#Copper), [Fluorine](https://owl.cengage.com/departments/GenChemZumdahl8eAPDemo0312/appendix/thermodynamic.html#Fluorine), [Hydrogen](https://owl.cengage.com/departments/GenChemZumdahl8eAPDemo0312/appendix/thermodynamic.html#Hydrogen), [Iodine](https://owl.cengage.com/departments/GenChemZumdahl8eAPDemo0312/appendix/thermodynamic.html#Iodine), [Iron](https://owl.cengage.com/departments/GenChemZumdahl8eAPDemo0312/appendix/thermodynamic.html#Iron), [Lead](https://owl.cengage.com/departments/GenChemZumdahl8eAPDemo0312/appendix/thermodynamic.html#Lead), [Magnesium](https://owl.cengage.com/departments/GenChemZumdahl8eAPDemo0312/appendix/thermodynamic.html#Magnesium), [Manganese](https://owl.cengage.com/departments/GenChemZumdahl8eAPDemo0312/appendix/thermodynamic.html#Manganese), [Mercury](https://owl.cengage.com/departments/GenChemZumdahl8eAPDemo0312/appendix/thermodynamic.html#Mercury), [Nickel](https://owl.cengage.com/departments/GenChemZumdahl8eAPDemo0312/appendix/thermodynamic.html#Nickel),[Nitrogen](https://owl.cengage.com/departments/GenChemZumdahl8eAPDemo0312/appendix/thermodynamic.html#Nitrogen), [Oxygen](https://owl.cengage.com/departments/GenChemZumdahl8eAPDemo0312/appendix/thermodynamic.html#Oxygen), [Phosphorus](https://owl.cengage.com/departments/GenChemZumdahl8eAPDemo0312/appendix/thermodynamic.html#Phosphorus), [Potassium](https://owl.cengage.com/departments/GenChemZumdahl8eAPDemo0312/appendix/thermodynamic.html#Potassium), [Silicon](https://owl.cengage.com/departments/GenChemZumdahl8eAPDemo0312/appendix/thermodynamic.html#Silicon), [Silver](https://owl.cengage.com/departments/GenChemZumdahl8eAPDemo0312/appendix/thermodynamic.html#Silver), [Sodium](https://owl.cengage.com/departments/GenChemZumdahl8eAPDemo0312/appendix/thermodynamic.html#Sodium), [Sulfur](https://owl.cengage.com/departments/GenChemZumdahl8eAPDemo0312/appendix/thermodynamic.html#Sulfur), [Tin](https://owl.cengage.com/departments/GenChemZumdahl8eAPDemo0312/appendix/thermodynamic.html#Tin), [Titanium](https://owl.cengage.com/departments/GenChemZumdahl8eAPDemo0312/appendix/thermodynamic.html#Titanium),[Uranium](https://owl.cengage.com/departments/GenChemZumdahl8eAPDemo0312/appendix/thermodynamic.html#Uranium), [Xenon](https://owl.cengage.com/departments/GenChemZumdahl8eAPDemo0312/appendix/thermodynamic.html#Xenon), [Zinc](https://owl.cengage.com/departments/GenChemZumdahl8eAPDemo0312/appendix/thermodynamic.html#Zinc)

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| **Aluminum** | **ΔHof (kJ/mol)** | **ΔGof (kJ/mol)** | **So (J/mol K)** |
| Al (s) | 0 | 0 | 28.3 |
| AlCl3 (s) | -704.2 | -628.8 | 110.7 |
| Al2O3 (s) | -1675.7 | -1582.3 | 50.9 |
| Al(OH)3 (s) | -1277.0 |  |  |

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| **Barium** | **ΔHof (kJ/mol)** | **ΔGof (kJ/mol)** | **So (J/mol K)** |
| Ba (s) | 0 | 0 | 67.0 |
| BaCl2(s) | -858.6 | -810.4 | 123.7 |
| BaCO3 (s) | -1219.0 | -1139.0 | 112.0 |
| BaO (s) | -553.5 | -525.1 | 70.4 |
| Ba(OH)2 (s) | -946.0 |  |  |
| BaSO4 (s) | -1473.2 | -1362.2 | 132.2 |

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| **Beryllium** | **ΔHof (kJ/mol)** | **ΔGof (kJ/mol)** | **So (J/mol K)** |
| Be (s) | 0 | 0 | 9.5 |
| BeO (s) | -599.0 | -569.0 | 14.0 |
| Be(OH)2 (s) | -902.5 | -815.0 | 51.9 |

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| **Bromine** | **ΔHof (kJ/mol)** | **ΔGof (kJ/mol)** | **So (J/mol K)** |
| Br (g) | 111.9 | 82.4 | 175.0 |
| Br2 (l) | 0 | 0 | 152.2 |
| Br2 (g) | 30.9 | 3.1 | 245.5 |
| Br2 (aq) | -3.0 | 4.0 | 130.0 |
| Br- (aq) | -121.0 | -175.0 | 82.0 |
| BrF3 (g) | -255.6 | -229.4 | 292.5 |
| HBr (g) | -36.3 | -53.5 | 198.7 |

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| **Cadmium** | **ΔHof (kJ/mol)** | **ΔGof (kJ/mol)** | **So (J/mol K)** |
| Cd (s) | 0 | 0 | 52.0 |
| CdO (s) | -258.0 | -228.0 | 55.0 |
| Cd(OH)2 (s) | -561.0 | -474.0 | 96.0 |
| CdS (s) | -162.0 | -156.0 | 65.0 |
| CdSO4 (s) | -935.0 | -823.0 | 123.0 |

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| **Calcium** | **ΔHof (kJ/mol)** | **ΔGof (kJ/mol)** | **So (J/mol K)** |
| Ca (s) | 0 | 0 | 41.4 |
| Ca (g) | 178.2 | 144.3 | 158.9 |
| Ca2+ (g) | 1925.9 |  |  |
| CaC2 (s) | -59.8 | -64.9 | 70.0 |
| CaCO3 (s, calcite) | -1206.9 | -1128.8 | 92.9 |
| CaCl2 (s) | -795.8 | -748.1 | 104.6 |
| CaF2 (s) | -1219.6 | -1167.3 | 68.9 |
| CaH2 (s) | -186.2 | -147.2 | 42.0 |
| CaO (s) | -635.1 | -604.0 | 39.8 |
| CaS (s) | -482.4 | -477.4 | 56.5 |
| Ca(OH)2 (s) | -986.1 | -898.5 | 83.4 |
| Ca(OH)2 (aq) | -1002.8 | -868.1 | -74.5 |
| Ca3(PO4)2 (s) | -4126.0 | -3890.0 | 241.0 |
| CaSO4 (s) | -1434.1 | -1321.8 | 106.7 |
| CaSiO3 (s) | -1630.0 | -1550.0 | 84.0 |

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| **Carbon** | **ΔHof (kJ/mol)** | **ΔGof (kJ/mol)** | **So (J/mol K)** |
| C (s, graphite) | 0 | 0 | 5.7 |
| C (s, diamond) | 1.9 | 2.9 | 2.4 |
| C (g) | 716.7 | 671.3 | 158.1 |
| CCl4(l) | -135.4 | -65.2 | 216.4 |
| CCl4 (g) | -102.9 | -60.6 | 309.9 |
| CHCl3 (l) | -134.5 | -73.7 | 201.7 |
| CHCl3 (g) | -103.1 | -70.3 | 295.7 |
| CH4 (g) | -74.8 | -50.7 | 186.3 |
| CH3OH (g) | -200.7 | -162.0 | 239.8 |
| CH3OH (l) | -238.7 | -166.3 | 126.8 |
| H2CO (g) | -116.0 | -110.0 | 219.0 |
| HCOOH (g) | -363.0 | -351.0 | 249.0 |
| HCN (g) | 135.1 | 125.0 | 202.0 |
| C2H2 (g) | 226.7 | 209.2 | 200.9 |
| C2H4 (g) | 52.3 | 68.2 | 219.6 |
| CH3CHO (g, acetaldehyde) | -166.0 | -129.0 | 250.0 |
| C2H4O (g, ethylene oxide) | -53.0 | -13.0 | 242.0 |
| CH3CH2OH (l) | -277.7 | -174.8 | 160.7 |
| CH3CH2OH (g) | -235.1 | -168.5 | 282.7 |
| CH3COOH (l) | -484.0 | -389.0 | 160.0 |
| C2H6 (g) | -84.7 | -32.8 | 229.6 |
| C3H6 (g) | 20.9 | 62.7 | 266.9 |
| C3H8 (g) | -103.8 | -23.5 | 269.9 |
| CH2=CHCN (l) | 152.0 | 190.0 | 274.0 |
| C6H6 (l) | 49.0 | 124.5 | 172.8 |
| C6H12O6 (s) | -1275.0 | -911.0 | 212.0 |
| CO (g) | -110.5 | -137.2 | 197.7 |
| CO2 (g) | -393.5 | -394.4 | 213.7 |
| CS2 (g) | 117.4 | 67.1 | 237.8 |
| COCl2 (g) | -218.8 | -204.6 | 283.5 |

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| **Chlorine** | **ΔHof (kJ/mol)** | **ΔGof (kJ/mol)** | **So (J/mol K)** |
| Cl (g) | 121.7 | 105.7 | 165.2 |
| Cl2 (g) | 0 | 0 | 223.1 |
| Cl2 (aq) | -23.0 | 7.0 | 121.0 |
| Cl- (aq) | -167.0 | -131.0 | 57.0 |
| Cl- (g) | -233.1 |  |  |
| HCl (g) | -92.3 | -95.3 | 186.9 |
| HCl (aq) | -167.2 | -131.2 | 56.5 |

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| **Chromium** | **ΔHof (kJ/mol)** | **ΔGof (kJ/mol)** | **So (J/mol K)** |
| Cr (s) | 0 | 0 | 23.8 |
| Cr2O3 (s) | -1139.7 | -1058.1 | 81.2 |
| CrO3 (s) | -579.0 | -502.0 | 72.0 |
| CrCl3 (s) | -556.5 | -486.1 | 123.0 |

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| **Copper** | **ΔHof (kJ/mol)** | **ΔGof (kJ/mol)** | **So (J/mol K)** |
| Cu (s) | 0 | 0 | 33.2 |
| CuCl2 (s) | -220.1 | -175.7 | 108.1 |
| CuCO3 (s) | -595.0 | -518.0 | 88.0 |
| Cu2O (s) | -170.0 | -148.0 | 93.0 |
| CuO (s) | -157.3 | -129.7 | 42.6 |
| Cu(OH)2 (s) | -450.0 | -372.0 | 108.0 |
| CuS (s) | -49.0 | -49.0 | 67.0 |

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| **Fluorine** | **ΔHof (kJ/mol)** | **ΔGof (kJ/mol)** | **So (J/mol K)** |
| F2 (g) | 0 | 0 | 202.8 |
| F (g) | 79.0 | 61.9 | 158.8 |
| F- (g) | -255.4 |  |  |
| F- (aq) | -332.6 | -278.8 | -13.8 |
| HF (g) | -271.1 | -273.2 | 173.8 |
| HF (aq) | -332.6 | -278.8 | 88.7 |

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| **Hydrogen** | **ΔHof (kJ/mol)** | **ΔGof (kJ/mol)** | **So (J/mol K)** |
| H2 (g) | 0 | 0 | 130.7 |
| H (g) | 218.0 | 203.2 | 114.7 |
| H+ (g) | 1536.2 |  |  |
| H+ (aq) | 0 |  |  |
| OH- (aq) | -230.0 | -157.0 | -11.0 |
| H2O (l) | -285.8 | -237.1 | 69.9 |
| H2O (g) | -241.8 | -228.6 | 188.8 |
| H2O2 (l) | -187.8 | -120.4 | 109.6 |

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| **Iodine** | **ΔHof (kJ/mol)** | **ΔGof (kJ/mol)** | **So (J/mol K)** |
| I2 (s) | 0 | 0 | 116.1 |
| I2 (g) | 62.4 | 19.3 | 260.7 |
| I2 (aq) | 23.0 | 16.0 | 137 |
| I (g) | 106.8 | 70.3 | 180.8 |
| I- (g) | -197.0 |  |  |
| I- (aq) | -55.0 | -52.0 | 106.0 |
| ICl (g) | 17.8 | -5.5 | 247.6 |

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| **Iron** | **ΔHof (kJ/mol)** | **ΔGof (kJ/mol)** | **So (J/mol K)** |
| Fe (s) | 0 | 0 | 27.8 |
| Fe3C (s) | 21.0 | 15.0 | 108.0 |
| FeCl2 (s) | -341.8 | -302.3 | 118.0 |
| FeCl3 (s) | -399.5 | -333.9 | 142.3 |
| Fe0.95O (s) (wustite) | -264.0 | -240.0 | 59.0 |
| FeO (s) | -272.0 |  |  |
| Fe3O4 (s, magnetite) | -1118.4 | -1015.4 | 146.4 |
| Fe2O3 (s, hematite) | -824.2 | -742.2 | 87.4 |
| FeS (s) | -95.0 | -97.0 | 67.0 |
| FeS2 (s, pyrite) | -178.2 | -166.9 | 52.9 |
| FeSO4 (s) | -929.0 | -825.0 | 121.0 |
| Fe(CO)5 (l) | -774.0 | -705.3 | 338.1 |

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| **Lead** | **ΔHof (kJ/mol)** | **ΔGof (kJ/mol)** | **So (J/mol K)** |
| Pb (s) | 0 | 0 | 64.8 |
| PbCl2 (s) | -359.4 | -314.1 | 136.0 |
| PbO (s, yellow) | -217.3 | -187.9 | 68.7 |
| PbO2 (s) | -277.0 | -217.0 | 69.0 |
| PbS (s) | -100.4 | -98.7 | 91.2 |
| PbSO4 (s) | -920.0 | -813.0 | 149.0 |

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| **Magnesium** | **ΔHof (kJ/mol)** | **ΔGof (kJ/mol)** | **So (J/mol K)** |
| Mg (s) | 0 | 0 | 32.7 |
| MgCl2 (s) | -641.3 | -591.8 | 89.6 |
| MgCO3 (s) | -1095.8 | -1012.1 | 65.7 |
| MgO (s) | -601.7 | -569.4 | 26.9 |
| Mg(OH)2 (s) | -924.5 | -833.5 | 63.2 |
| MgS (s) | -346.0 | -341.8 | 50.3 |

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| **Manganese** | **ΔHof (kJ/mol)** | **ΔGof (kJ/mol)** | **So (J/mol K)** |
| Mn (s) | 0 | 0 | 32.0 |
| MnO (s) | -385.0 | -363.0 | 60.0 |
| Mn3O4 (s) | -1387.0 | -1280.0 | 149.0 |
| Mn2O3 (s) | -971.0 | -893.0 | 110.0 |
| MnO2 (s) | -521.0 | -466.0 | 53.0 |
| MnO4- (aq) | -543.0 | -449.0 | 190.0 |

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| **Mercury** | **ΔHof (kJ/mol)** | **ΔGof (kJ/mol)** | **So (J/mol K)** |
| Hg (l) | 0 | 0 | 75.9 |
| HgCl2 (s) | -224.3 | -178.6 | 146.0 |
| Hg2Cl2(s) | -265.4 | -210.7 | 191.7 |
| HgO (s, red) | -90.8 | -58.5 | 70.3 |
| HgS (s, red) | -58.2 | -50.6 | 82.4 |

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| **Nickel** | **ΔHof (kJ/mol)** | **ΔGof (kJ/mol)** | **So (J/mol K)** |
| Ni (s) | 0 | 0 | 29.9 |
| NiCl2 (s) | -305.3 | -259.0 | 97.7 |
| NiO (s) | -239.7 | -211.7 | 38.0 |
| Ni(OH)2 (s) | -538.0 | -453.0 | 79.0 |
| NiS (s) | -93.0 | -90.0 | 53.0 |

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| **Nitrogen** | **ΔHof (kJ/mol)** | **ΔGof (kJ/mol)** | **So (J/mol K)** |
| N2 (g) | 0 | 0 | 191.6 |
| N (g) | 472.7 | 455.6 | 153.3 |
| NH3 (g) | -46.1 | -16.5 | 192.5 |
| NH3 (aq) | -80.0 | -27.0 | 111.0 |
| NH4+ (aq) | -132.0 | -79.0 | 113.0 |
| NO (g) | 90.3 | 86.6 | 210.8 |
| NOCl (g) | 51.7 | 66.1 | 261.8 |
| NO2 (g) | 33.2 | 51.3 | 240.1 |
| N2O (g) | 82.1 | 104.2 | 219.9 |
| N2O4 (g) | 9.2 | 97.9 | 304.3 |
| N2O4 (l) | -20.0 | 97.0 | 209.0 |
| N2O5 (s) | -42.0 | 134.0 | 178.0 |
| N2H4 (l) | 50.6 | 149.3 | 121.2 |
| N2H3CH3 (l) | 54.0 | 180.0 | 166.0 |
| HNO3 (aq) | -207.4 | -111.3 | 146.4 |
| HNO3 (l) | -174.1 | -80.7 | 155.6 |
| HNO3 (g) | -135.1 | -74.7 | 266.4 |
| NH4ClO4 (s) | -295.0 | -89.0 | 186.0 |
| NH4Cl (s) | -314.4 | -202.9 | 94.6 |
| NH4Cl (aq) | -299.7 | -210.5 | 169.9 |
| NH4NO3 (s) | -365.6 | -183.9 | 151.1 |
| NH4NO3 (aq) | -339.9 | -190.6 | 259.8 |

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| **Oxygen** | **ΔHof (kJ/mol)** | **ΔGof (kJ/mol)** | **So (J/mol K)** |
| O2 (g) | 0 | 0 | 205.1 |
| O (g) | 249.2 | 231.7 | 161.1 |
| O3 (g) | 142.7 | 163.2 | 238.9 |

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| **Phosphorus** | **ΔHof (kJ/mol)** | **ΔGof (kJ/mol)** | **So (J/mol K)** |
| P (s, white) | 0 | 0 | 164.4 |
| P (s, red) | -70.4 | -48.4 | 91.2 |
| P (s, black) | -39.0 | -33.0 | 23.0 |
| P (g) | 314.6 | 278.3 | 163.2 |
| P4 (s, white) | 0 | 0 | 41.1 |
| P4 (s, red) | -17.6 | -12.1 | 22.8 |
| P4 (g) | 59.0 | 24.0 | 280.0 |
| PF5 (g) | -1578.0 | -1509.0 | 296.0 |
| PH3 (g) | 5.4 | 13.4 | 210.2 |
| PCl3 (g) | -287.0 | -267.8 | 311.8 |
| H3PO4 (l) | -1279.0 | -1119.1 | 110.5 |
| H3PO4 (aq) | -1288.0 | -1143.0 | 158.0 |
| P4O10 (s) | -2984.0 | -2697.7 | 228.9 |

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| **Potassium** | **ΔHof (kJ/mol)** | **ΔGof (kJ/mol)** | **So (J/mol K)** |
| K (s) | 0 | 0 | 64.2 |
| KCl (s) | -436.7 | -409.1 | 82.6 |
| KClO3 (s) | -397.7 | -296.3 | 143.1 |
| KClO4 (s) | -433.0 | -304.0 | 151.0 |
| KI (s) | -327.9 | -324.9 | 106.3 |
| K2O (s) | -361.0 | -322.0 | 98.0 |
| K2O2 (s) | -496.0 | -430.0 | 113.0 |
| KO2 (s) | -283.0 | -238.0 | 117.0 |
| KOH (s) | -424.8 | -379.1 | 78.9 |
| KOH (aq) | -482.4 | -440.5 | 91.6 |

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| **Silicon** | **ΔHof (kJ/mol)** | **ΔGof (kJ/mol)** | **So (J/mol K)** |
| Si (s) | 0 | 0 | 18.3 |
| SiBr4 (l) | -457.3 | -443.9 | 277.8 |
| SiC (s) | -65.3 | -62.8 | 16.6 |
| SiCl4 (g) | -657.0 | -617.0 | 330.7 |
| SiH4 (g) | 34.3 | 56.9 | 204.6 |
| SiF4 (g) | -1614.9 | -1572.7 | 282.5 |
| SiO2 (s, quartz) | -910.9 | -856.6 | 41.8 |

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| **Silver** | **ΔHof (kJ/mol)** | **ΔGof (kJ/mol)** | **So (J/mol K)** |
| Ag (s) | 0 | 0 | 42.6 |
| Ag+ (aq) | 105.0 | 77.0 | 73.0 |
| AgBr (s) | -100.0 | -97.0 | 107.0 |
| AgCN (s) | 146.0 | 164.0 | 84.0 |
| AgCl (s) | -127.1 | -109.8 | 96.2 |
| Ag2CrO4 (s) | -712.0 | -622.0 | 217.0 |
| AgI (s) | -62.0 | -66.0 | 115.0 |
| Ag2O (s) | -31.1 | -11.2 | 121.3 |
| AgNO3 (s) | -124.4 | -33.4 | 140.9 |
| Ag2S (s) | -32.0 | -40.0 | 146.0 |

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| **Sodium** | **ΔHof (kJ/mol)** | **ΔGof (kJ/mol)** | **So (J/mol K)** |
| Na (s) | 0 | 0 | 51.2 |
| Na (g) | 107.3 | 76.8 | 153.7 |
| Na+ (g) | 609.4 |  |  |
| Na+ (aq) | -240.0 | -262.0 | 59.0 |
| NaBr (s) | -361.0 | -349.0 | 86.8 |
| Na2CO3 (s) | -1130.7 | -1044.4 | 135.0 |
| NaHCO3 (s) | -948.0 | -852.0 | 102.0 |
| NaCl (s) | -411.2 | -384.1 | 72.1 |
| NaCl (g) | -176.7 | -196.7 | 229.8 |
| NaCl (aq) | -407.3 | -393.1 | 115.5 |
| NaH (s) | -56.0 | -33.0 | 40.0 |
| NaI (s) | -288.0 | -282.0 | 91.0 |
| NaNO2 (s) | -359.0 |  |  |
| NaNO3 (s) | -467.0 | -366.0 | 116.0 |
| Na2O (s) | -416.0 | -377.0 | 73.0 |
| Na2O2 (s) | -515.0 | -451.0 | 95.0 |
| NaOH (s) | -425.6 | -379.5 | 64.5 |
| NaOH (aq) | -470.1 | -419.2 | 48.1 |

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| **Sulfur** | **ΔHof (kJ/mol)** | **ΔGof (kJ/mol)** | **So (J/mol K)** |
| S (s, rhombic) | 0 | 0 | 31.8 |
| S (s, monoclinic) | 0.3 | 0.1 | 33.0 |
| S (g) | 278.8 | 238.3 | 167.8 |
| S2- (aq) | 33.0 | 86.0 | -15.0 |
| S8 (g) | 102.0 | 50.0 | 431.0 |
| S2Cl2 (g) | -18.4 | -31.8 | 331.5 |
| SF6 (g) | -1209.0 | -1105.3 | 291.8 |
| H2S (g) | -20.6 | -33.6 | 205.8 |
| SO2 (g) | -296.8 | -300.2 | 248.2 |
| SO3 (g) | -395.7 | -371.1 | 256.8 |
| SOCl2 (g) | -212.5 | -198.3 | 309.8 |
| SO42- (aq) | -909.0 | -745.0 | 20.0 |
| H2SO4 (l) | -814.0 | -690.0 | 156.9 |
| H2SO4 (aq) | -909.3 | -744.5 | 20.1 |

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| **Tin** | **ΔHof (kJ/mol)** | **ΔGof (kJ/mol)** | **So (J/mol K)** |
| Sn (s, white) | 0 | 0 | 51.6 |
| Sn (s, gray) | -2.1 | 0.1 | 44.1 |
| SnCl4 (l) | -511.3 | -440.1 | 258.6 |
| SnCl4 (g) | -471.5 | -432.2 | 365.8 |
| SnO (s) | -285.0 | -257.0 | 56.0 |
| SnO2 (s) | -580.7 | -519.6 | 52.3 |
| Sn(OH)2 (s) | -561.0 | -492.0 | 155.0 |

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| **Titanium** | **ΔHof (kJ/mol)** | **ΔGof (kJ/mol)** | **So (J/mol K)** |
| Ti (s) | 0 | 0 | 30.6 |
| TiCl4 (l) | -804.2 | -737.2 | 252.3 |
| TiCl4 (g) | -763.2 | -726.7 | 354.9 |
| TiO2 (s) | -939.7 | -884.5 | 49.9 |

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| **Uranium** | **ΔHof (kJ/mol)** | **ΔGof (kJ/mol)** | **So (J/mol K)** |
| U (s) | 0 | 0 | 50.0 |
| UF6 (s) | -2137.0 | -2008.0 | 228.0 |
| UF6 (g) | -2113.0 | -2029.0 | 380.0 |
| UO2 (s) | -1084.0 | -1029.0 | 78.0 |
| U3O8 (s) | -3575.0 | -3393.0 | 282.0 |
| UO3 (s) | -1230.0 | -1150.0 | 99.0 |

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| **Xenon** | **ΔHof (kJ/mol)** | **ΔGof (kJ/mol)** | **So (J/mol K)** |
| Xe (g) | 0 | 0 | 170.0 |
| XeF2 (g) | -108.0 | -48.0 | 254.0 |
| XeF4 (s) | -251.0 | -121.0 | 146.0 |
| XeF6 (g) | -294.0 |  |  |
| XeO3 (s) | 402.0 |  |  |

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| **Zinc** | **ΔHof (kJ/mol)** | **ΔGof (kJ/mol)** | **So (J/mol K)** |
| Zn (s) | 0 | 0 | 41.6 |
| ZnCl2 (s) | -415.1 | -369.4 | 111.5 |
| ZnO (s) | -348.3 | -318.3 | 43.6 |
| Zn(OH)2 (s) | -642.0 |  |  |
| ZnS (s, wurtzite) | -193.0 |  |  |
| ZnS (s, zinc blende) | -206.0 | -201.3 | 57.7 |
| ZnSO4 (s) | -983.0 | -874.0 | 120.0 |