

$$R = 0.08206 \frac{\text{L} \cdot \text{atm}}{\text{mol} \cdot \text{K}} = 8.314 \text{ J}/(\text{mol} \cdot \text{K})$$

$$E_K = \frac{1}{2} m v^2 \quad \Delta H = \Delta E + P \Delta V$$

$$\ln \frac{P_2}{P_1} = \left(\frac{\Delta H_{\text{vap}}}{R} \right) \left(\frac{1}{T_1} - \frac{1}{T_2} \right)$$

$$1 \text{ atm} = 101,325 \text{ Pa} = 760 \text{ torr} = 760 \text{ mmHg}$$

$$1 \text{ bar} = 100,000 \text{ Pa} = 0.986923 \text{ atm}$$

Possibly Needed Constants:

Density of Ice at 0°C = 0.9167 g/cm³

Density of Water at 0°C = 0.9998 g/cm³

Heat of vaporization of water = 40.67 kJ/mol

Heat of fusion of water = 6.01 kJ/mol

Molar heat capacity of water = 75.3 J/molK

Heat capacity of steam = 37.47 J/molK

TABLE B.1 Inorganic Substances (*continued*)

Substance and State	ΔH°_f (kJ/mol)	ΔG°_f (kJ/mol)	S° [J/(K · mol)]
<i>Nitrogen</i>			
N(g)	472.7	455.6	153.2
N ₂ (g)	0	0	191.5
NH ₃ (g)	-46.1	-16.5	192.3
NH ₃ (aq)	-80.3	-26.6	111
NH ₄ ⁺ (aq)	-132.5	-79.4	113
N ₂ H ₄ (l)	50.6	149.2	121.2
N ₂ H ₄ (g)	95.4	159.3	238.4
NO(g)	91.3	87.6	210.7
NO ₂ (g)	33.2	51.3	240.0
N ₂ O(g)	82.0	104.2	219.7
N ₂ O ₄ (g)	11.1	99.8	304.3
N ₂ O ₅ (g)	13.3	117.1	355.6
NOCl(g)	51.7	66.1	261.6
NO ₂ Cl(g)	12.6	54.4	272.1
HNO ₃ (l)	-174.1	-80.8	155.6
HNO ₃ (g)	-133.9	-73.5	266.8
HNO ₂ (aq)	-119	-50.6	136
HNO ₃ (aq)	-207.4	-111.3	146.4
NO ₃ ⁻ (aq)	-207.4	-111.3	146.4
NH ₄ Cl(s)	-314.4	-202.9	94.6
NH ₄ NO ₃ (s)	-365.6	-184.0	151.1
<i>Hydrogen</i>			
H(g)	218.0	203.3	114.6
H ⁺ (aq)	0	0	0
H ₂ (g)	0	0	130.6
OH ⁻ (aq)	-230.0	-157.3	-10.8
H ₂ O(l)	-285.8	-237.2	69.9
H ₂ O(g)	-241.8	-228.6	188.7
H ₂ O ₂ (l)	-187.8	-120.4	110
H ₂ O ₂ (g)	-136.3	-105.6	232.6
H ₂ O ₂ (aq)	-191.2	-134.1	144

Score: _____/100 points