

Entropy and phase changes

According to Wikipedia's article "Latent heat", the latent heat of melting for water is 334 J/g (at temperature $0^\circ\text{C} = 273\text{ K}$), while the latent heat of vaporization for water is 2265 J/g (at temperature $100^\circ\text{C} = 373\text{ K}$). Thus the entropy change upon melting is

$$\Delta S = \frac{Q}{T} = \frac{(334\text{ J/g})(7.22\text{ g})}{273\text{ K}} = 8.83\text{ J/K}$$

while the entropy change upon vaporization is

$$\Delta S = \frac{Q}{T} = \frac{(2265\text{ J/g})(7.22\text{ g})}{373\text{ K}} = 43.8\text{ J/K}.$$

[Typically the entropy change due to vaporization is far greater than the entropy change due to melting.]