

Name: _____

Student number: _____

- Some general data are provided on this page.
- A Periodic Table with atomic weights is provided on the next page.

$$R = 8.3145 \text{ J K}^{-1} \text{ mol}^{-1} = 0.08206 \text{ L atm K}^{-1} \text{ mol}^{-1}$$

$$c = 2.9979 \times 10^8 \text{ m s}^{-1}$$

$$m_e = 9.10 \times 10^{-31} \text{ kg}$$

$$\text{Specific heat of H}_2\text{O(s)} = 2.03 \text{ J / g} \cdot ^\circ\text{C}$$

$$\text{Specific heat of H}_2\text{O(l)} = 4.18 \text{ J / g} \cdot ^\circ\text{C}$$

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

$$h = 6.6256 \times 10^{-34} \text{ Js}$$

$$\text{density(H}_2\text{O, l)} = 1.00 \text{ g/mL}$$

$$\Delta H_{\text{fus}}^\circ[\text{H}_2\text{O}] = 6.01 \text{ kJ mol}^{-1}$$

$$\Delta H_{\text{vap}}^\circ[\text{H}_2\text{O}] = 44.0 \text{ kJ mol}^{-1}$$

$$1 \text{ atm} = 101.325 \text{ kPa} = 760 \text{ mm Hg}$$

$$1 \text{ J} = 1 \text{ kg m}^2 \text{ s}^{-2} = 1 \text{ kPa L} = 1 \text{ Pa m}^3$$

$$1 \text{ cm}^3 = 1 \text{ mL}$$

$$1 \text{ Hz} = 1 \text{ cycle/s}$$

$$0^\circ\text{C} = 273.15 \text{ K}$$

$$1 \text{ m} = 10^9 \text{ nm} = 10^{10} \text{ \AA}$$

$$1 \text{ g} = 10^3 \text{ mg}$$

De Broglie wavelength:

$$\lambda = h / mv = h / p$$

Hydrogen atom energy levels:

$$E_n = -R_H / n^2 = -2.178 \times 10^{-18} \text{ J} / n^2$$

Gibbs free energy of reaction: $\Delta G = \Delta G^\circ + RT \ln Q$

$$\text{Entropy change: } \Delta S = \frac{q_{\text{rev}}}{T}$$

Solubility Guidelines for Common Ionic Solids**TABLE 5.1 Solubility Guidelines for Common Ionic Solids**

Follow the lower-numbered guideline when two guidelines are in conflict. This leads to the correct prediction in most cases.

1. Salts of group 1 cations (with some exceptions for Li^+) and the NH_4^+ cation are soluble.
2. Nitrates, acetates, and perchlorates are soluble.
3. Salts of silver, lead, and mercury(I) are insoluble.
4. Chlorides, bromides, and iodides are soluble.
5. Carbonates, phosphates, sulfides, oxides, and hydroxides are insoluble (sulfides of group 2 cations and hydroxides of Ca^{2+} , Sr^{2+} , and Ba^{2+} are slightly soluble).
6. Sulfates are soluble except for those of calcium, strontium, and barium.

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