

item	Performance/Task: The student will:	Tro - text sections
Molecular Geometry		
1	Know the rules for creating hybrid orbitals and be able to apply them to determine electron geometry	10.2, 10.7
2	From the molecular structure, be able to determine if a molecule is polar and, if so, what the orientation of the dipole is	11.4
3	From the hybrid orbitals and the lone electron pairs, be able to predict the electronic and molecular geometry	10.3,-10.7
4	Know the definition of sigma and pi bonds and the physical appearance and how these might affect geometry (including hindered rotation)	10.7
Intermolecular Forces and the Condensed Phases		
5	Be able to describe and rank the various inter-particle forces. (London, dipole/ionc-dipole/ionic, dipole-induced dipole, "hydrogen bond", ion-dipole)	11.3
6	Be able to describe and explain the relative boiling points and melting points from the inter-particle forces	11.5, 11.9
Liquid Phase		
7	Be able to do calculations based on the Clausius-Clapeyron equation and the associated van't Hoff plot	11.5
8	Be able to do calculations to obtain the total enthalpy using heat capacities and heats of phase changes	11.5
Phase Diagrams		
9	Know meaning and location of the regions, boundaries and points in a phase diagram (including the supercritical fluid.)	11.8
10	Be able to describe the equilibria involved for each phase boundary and point.	11.8
Solid State		
11	Be able to describe some simple crystal structures for solids and do calculations based on these structures.	11.10
12	Be able to identify types of solids and describe the inter-particle forces for each type. (ionic, metallic, covalent, molecular)	11.11
13	Be able to describe a system that is in dynamic equilibrium.	11.5

Electrolytic Solutions		
14	Know the general characteristic of electrolytic and non-electrolytic solutions and the molecular dynamics involved	12.2
15	Be able to describe qualitatively what entropy is and its importance for solutions and solubility	
16	Given enthalpies of solution, be able to describe the temperature effects involved in solubility.	12.3, 12.4
17	Be able to do calculations based upon Henry's law	12.4
18	Be able to calculate mole fraction and molality.	12.5
19	Know the definitions of and be able to interconvert between molarity, percent concentration, molality and mole fraction.	12.5
Colligative Properties and Mole Fraction		
20	Know the definition of colligative properties and the dependence upon mole fraction of solvent.	12.6
21	Be able use Raoult's law in calculations.	12.6
22	Be able calculate freezing point depression and boilint point elevation.	12.6
23	Be able calculate osmotic pressure.	12.6
24	Know how to modify the colligative property calculations with the total concentration for electrolytic solutions, i.e. van't Hoff factor.	12.7