

The final exam will include all materials starting from the beginning of the course.

Crossed out items can be ignored in fall 2010.

Consequently, the Checklists for the Quiz and the MidTerm Exam, provided earlier, are applicable and all items should be reviewed.

The Data Sheet (CDS) will be identical

Notes: - This list is not necessarily exhaustive; ultimately, you are responsible for whatever came up in class!

Properties and Behavior of Gases

explain T and P on the molecular basis
differentiate between various expressions
for pressure: atmospheric,
gauge(differential), absolute, barometric
know the avg. atmospheric pressure in Edm.
Ideal Gas Law & derivation of individual
gas laws
applications of IGL: determination of
D \leftrightarrow MM; gas stoichiometry
vapor pressure of liquids & VP curves
def. of mole fraction & partial pressure
Dalton's Law of partial pressures
application of Dalton's Law: collection of
gases over liquids; use of partial pressures
in stoichiometry

Kinetic Molecular Theory

basic assumptions
overall results
dependence of molecular speeds & KE on
temperature and MM
distribution of molecular speeds (Maxwell -
Boltzmann)
definition & application of effusion &
diffusion phenomena
deviation of real gases from ideal behavior
correction factors in the vdW equation
~~comparison between real & ideal gases~~

Intermolecular Forces

describe the forces that cause deviation from
ideal gas behavior; illustrate & give
examples
intramolecular forces: covalent, ionic,
metallic
intermolecular forces: ion-dipole, ion-
induced dipole, dipole-dipole, H-bonding,
dipole-induced dipole, momentary dipole-
induced dipole
predict major IMF's based on molecular
structure

assess H-bonding between identical & different
molecules
describe the nature of LDF's
effect of polarizability on LDF's
effect of IMF's on solubility, vapor pressure,
b.p., m.p.

Liquids

rudimentary knowledge:
liquid properties: dense, but mobile
know definition of viscosity, surface tension,
cohesive & adhesive forces

Solids

distinguish between amorphous & crystalline
arrangements in solids
*for molecular, network covalent, ionic &
metallic solids:*
describe nature of IMF's,
indicate resulting macroscopic properties
provide examples, incl. structures
~~rudimentary knowledge of band theory~~
basic crystallography:
unit cells, close packing, coordination
numbers, density

Phase Diagrams (PD)

provide definition for pure substances
draw generic PD & identify/describe various
points/regions: triple point, critical point,
phase transitions, single phases (S, L, G)
assess effect of P & T changes on the
existence of various phases

Acid/Base (A/B) Chemistry

3 different definitions of A/B
A/B behavior of "hydrides" & oxides
periodic trends of acid strength of
hydrides/oxides and of oxoacids
conjugate A/B concept
acidity of cations