

Things to think about for the CHEM 301 Mid-Term

Define, describe and provide examples of new terms, residence time, chemical processes, chemical activity, composition of natural waters, chemical rxns, equilibria and chemical speciation.

Interpretation of speciation diagrams

pH speciation diagrams

p[ligand] diagrams

pe-pH diagrams

Interpretation of chemical behaviours

acid/base properties

solubility, complexation

redox changes

Calculations

units of concentration (mol/L, mg/L, ppm, ppb; element vs chemical species)

charge balance and activity co-efficients

residence times (and first order kinetics)

acid-base reactions (pH, pK_a, [H⁺], [A⁻]/[HA], [alk])

solubility reactions (K_{sp} and K_H) and interactions of solubility with pH and [gases]

redox changes (E^o, pe^o, pe^o(w), pe)

both pe and pH (pe = pe^o - 1/n log Q)

Things you will get along with the questions:

Periodic Table

Speciation Diagrams

Formula Sheet

Data Tables

Things not to worry about:

Remembering constants, formulas and conversion factors.

Calculations involving topics not discussed in class, such as corrections due to changes in altitude (some of the textbook questions fall into this category).

Calculations involving long, repetitive steps (some of the assignment questions fall into this category).