

CHEM 242 STUDY GUIDE for EXAM #1

Exam: Thurs Jan 29. The exam will be during class time and you will get 50 minutes to work on the exam. It will be worth 80 points.

The exam will be over chapters 12 and 13 only. It will mostly be interpretation of IR and NMR spectra. The best items to study and review are in-class assignments, assigned problems from the text (see below) and the additional problem sets for IR and NMR (on web site).

There will be 2-3 problems involving definitions of NMR, MS and IR terms.

You will be able to use 1 page of notes (both sides). On this you should have all pertinent IR and NMR data.

Chapter 13 (NMR) emphasize sections 13.1, 13.2-13.7, 13.9-13.10. You will want to be able to define and understand the terms below and be adept at interpreting NMR spectra. There will be no two dimensional, DEPT or Carbon 13 spectra interpretation

Terms to know: Spin states, spin flip, Chemical shift, Shielding/deshielding by electrons, Integration, upfield/downfield, Multiplicity (singlet, doublet, triplet etc), Coupled protons/Coupling constant (J value).

Be able to draw an NMR spectrum of an organic compound (showing chemical shifts, integration and splitting patterns) as well as being able to interpret simple NMR spectra.

Problems from the text worth doing (some of these will be on the exam): 3, 4, 11, 15, 17, 21, 30, 43, 45, 46, 48, 50, 56b,

Chapter 12 (MS & IR)

Terms to know for Mass spec: Molecular ion/parent ion, radical cation, Base peak, Fragmentation pattern. Be able to predict what the base peak of a compound would be (review what makes a stable carbocation (tertirary/resonance etc)

From a mass spectra be able to obtain the molecular weight of the compound and locate the base peak (and predict what the structure of the base peak might be).

For Mass Spectroscopy study these problems from the text: 3, 10, 11, 41

Terms to know For IR: Spectroscopy, Absorption band, Stretching/bending vibrations, fingerprint region, Wave number and Infrared radiation.

Be able to interpret IR spectra (as in in-class #1).

One or two questions will have you determine a structure of a compound using MS, IR and NMR spectra of that compound.

For IR Spectroscopy study these problems from the text: 20a, 26a, 30, 33, 54, 56, 58, 60, 63, 65,66