

## Physical Chemistry Laboratory Experiments

Title	Instrument	Interest
<b>I. Thermochemistry</b>		
1. Enthalpy of Formation of Camphor	Bomb Calorimeter	Biology
2. Glycine Proton Transfer Enthalpies	Solution Calorimeter	Biochem
3. Thermometric Titration of Cyclodextrin-Tronac version	Tronac Calorimeter	Biochem
4. Thermometric Titration of Cyclodextrin-Microcal version	Microcal ITC	Biochem
5. Thermometric Titration of RNase A and 2'CMP	Microcal ITC	Biochem
6. Thermometric Titration of Tris and Pyridine	Vernier	Analytical
7. DSC: First and Second Order Transitions in Polymers	PE DSC-4*	Polymer
8. DSC of Bilayer Membrane Phase Transitions	Microcal DSC	Biochem
<b>II. Equilibrium</b>		
9. Guest-Host Complexation of Cyclodextrin (week 2)	HP Diode Array*	Biochem
10. Determination Of Enthalpy Of Enolization By NMR <sup>1</sup>	Bruker Avance NMR*	Organic
11. Deuterium Exchange in Keto-Enol Tautomerization	Varian GC/Mass Spec*	Organic
12. Equilibrium Constant of a Hydrogen Bonded Complex <sup>1</sup>	Bruker Avance NMR*	Organic
13. Kinetic Method: Silver Ion Affinities of Amino Acids	Agilent Ion Trap SE	Inorganic
14. The Solubility of AgBrO <sub>3</sub>	Leeman ICP-1000	Analytical
<b>III. Phase Equilibria- Solutions</b>		
15. Vapor Pressure and Molecular Weight Pure Liquid	Ace Vacuum Line	Inorganic
16. Liquid Vapor Equilibrium in a Binary System	Abbe' Refractometer	Organic
17. Binary Solid-Liquid Equilibria	PE DSC 4*	Geology
18. Purity Determinations by DSC	PE DSC 4*	Analytical
19. log P and MR	LDC HPLC	General
20. Henry's Law Constant and Free Energy of Solvation	Varian GC/Mass Spec*	Environ
21. Partial Molal Volume	Mettler Density Meter	General
22. Activities from Freezing Point Depression	Mettler Density Meter	General
23. Pressure Perturbation Calorimetry	Microcal DSC	Biochem
<b>IV. Kinetics</b>		
24. Inversion of Sucrose	Rudolf Polarimeter	Biochem
25. Kinetics of Ascorbic acid and Dichloroindophenol	HP Diode Array*	Biochem
26. Kinetics of Aquation of Cl <sub>2</sub> (en) <sub>2</sub> Co(III) (HP version)	HP Diode Array*	Inorganic
27. Kinetics of Aquation of Cl <sub>2</sub> (en) <sub>2</sub> Co(III) (Spec 20 version)	Spectronic 20	Inorganic
28. Laser Flash Photolysis	Luzchem LFP	Organic
29. NMR Determination of the Rotational Barrier of N,N-dimethylacetamide <sup>1</sup>	Bruker Avance NMR*	Organic

\* See the Instrument Instructions Section at the back of your lab manual for instructions on the use of this instrument.

### Notes:

1. Schedule a training session on the NMR before your lab day if you haven't used the NMR before.