

# Chem 321L: Exam II Review

**Saturday, December 5th, 2009 (12:00pm-2:00pm), Royall Hall, room 111!**  
**Bring two #2 pencils, an eraser, and a calculator to the exam!**  
**You need to know your student ID number and lab section for the exam!**

## Exam Format

- Multiple Choice
- True/False

## Techniques to Review from *Mohring*:

- **Laboratory Glassware** Technique 2 (pages 23-28)
- **Laboratory Notebook** Technique 3 (pages 30-33)
- **Heating and Cooling Methods** Technique 6 (pages 47-56)
- **Refluxing a Mixture** Technique 7 (Section 7.1; page 56)
- **Extraction and Drying Organic Liquids** Technique 8 (pages 75-100)
- **Drying Agents** Technique 8 (Sections 8.7 and 8.8; pages 92-95)
- **Recrystallization** Technique 9 (pages 100-116)
- **Melting-Point Theory** Technique 10 (pages 117-127)
- **Boiling Points and Distillation** Technique 11 (pages 127-157)

## Calculations to Review

- Percent Yield (page 33)
- Theoretical Yield
- Limiting Reactant
- How to calculate mmoles
- Understand Molarity ( $M$ )

## Experimental Sections (Labs 6-10 Only)

**You are responsible for knowing these labs backwards and forwards!**

6. Substitution Reactions  $S_N2$ : Synthesis of *trans*-1,2-dibenzoyl-cyclopropane
7. Substitution Reactions  $S_N1$ : triphenylmethanol
8. Elimination Reaction E1: Cyclohexene from cyclohexanol (fractional distillation)
9. Elimination Reaction E2: Cyclohexene from bromocyclohexane
10.  $X_2$  Addition to Alkenes: Bromination of *trans*-stilbene
  - Purpose of the labs
  - Know what happened in each lab
  - Chemical structures, names and steps of the reactions (what is happening in each step), predict products, possible side products
  - Reagents used and why (acids, bases, organic solvents, aqueous substances, etc)
  - Understand what  $S_N1$ ,  $S_N2$ , E1, E2 and  $X_2$  Addition reactions are, know their steps, and be able to identify-leaving group (substrate), nucleophile, catalyst, determine stereochemistry (R and S)
  - Chemical tests used
  - Know and be able to identify the IR frequency regions for OH stretch, C=C stretch and CO stretch.
  - Vocabulary (including miscibility, solubility, density, solvolysis, dehydration, etc)