Chemistry 125 Fifth Examination Name _____

February 9, 2004

1. (3 minutes) How would you interpret a situation where quadrupling the amount of a reagent only doubles its reaction rate?

6. (5 min) Show **reagents** for accomplishing the following conversion in a practical manner.
(No mechanisms are necessary, but do show the **isolable product from each reaction** in the required sequence).

$(CH_3)_3CH \rightarrow (CH_3)_3CD$

7. (5 min) Explain how the choice of reagents in the first step of the preparation in Question 6 might be influenced by familiarity with the Hammond Postulate.

Included only because of reference below **8**.(6 min) The following three alcohols have approximate pK_a values of 3, 10, and 16 (not necessarily in order). Under each formula write the appropriate pK_a., AND under the second and third list the factors that cause their acidity to differ from that of ethanol.

EtOH	$ClCH_2COOH$	C_6H_5OH ("carbolic acid")
pK_a =	pK_a =	pK_a =

9. (6 min) The chloroacetic acid in Question 8 could was prepared in the 1830s by chlorination of acetic acid. Write a mechanism for this reaction AND explain whether you think this reaction could be used to prepare the corresponding bromo- and iodoacetic acids.