**HOMEWORK ASSIGNMENT #9 ORGANIC CHEMISTRY I**

Your name:\_\_\_\_\_\_\_\_\_\_answers\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_/28

Due Wednesday 6 November 2013

**9.1. Mechanistic Fact Checking** (11 pts)

a)What common initial reaction is shared by the Sn1 and Sn2 reaction: ROH +X- 🡪RX ? **protonation of ROH**

b)Which mechanism features rearrangements and carbocations? \_\_\_**SN1\_**\_\_\_\_\_\_\_

c)t-butanol is most likely to react with HBr via which mechanism, Sn1 or Sn2 ?\_\_ **SN1\_**\_\_

d)Which substrate 0o,1o,2o or 3o exhibits the fastest reaction via Sn2 ? \_\_\_**0o\_**\_ lowest steric hindrance

e)I like soft, fuzzy, non-O bearing solvents, am moved by both substrate and nucleophile concentrations and am into weird 5-coordinated transition states. I am the \_\_\_\_\_\_\_ mechanism

f) Will 1-butanol rearrange during bromination ? YES NO

g) I don’t care a lick for the amount of halide in the reaction soup I operate in. I am the \_\_\_\_\_\_\_\_ mechanism.

h) My rate gets faster with the bigger, fatter halides. I am the \_\_ **SN2**\_\_\_\_\_\_mechanism.

i) With me, the substrate racemizes. I am the \_\_\_ **SN1\_**\_\_\_\_mechanism.

j) I invert the substrate every time. It’s my thing. I am the \_\_\_\_ **SN2\_**\_\_\_\_\_mechanism.

k)What is the `nucleophilic’ agent in either SN1 or SN2 mechanisms ? \_ROH2+\_\_\_\_\_\_\_

**9.2. Trendy Thoughts ( 9 pts)**

1. Circle the substrate that reacts faster with HCl(aqueous)/reflux conditions: (if same, circle **Same**)



Same

**30 2o**

Same



**2o 1o**



Same T*he second 2o alcohol slightly faster because methyls at position 3 are electron donors*



**2o  2o**

T*he two fluorines are electron-*

Same  *withdrawing, so will destabilize carbocation for halogenated alcohol*

1. Which condition will increase the rate of the reaction given: (If both, circle **Both. I**f neither circle **None)**

HBr + t-butanol Using polar protic solvent Using non-protic solvent Both None

HBr + t-butanol Increasing HBr concentration Increasing H2SO4 concentration Both None

HBr + 1-butanol Increasing HBr concentration Increasing H2SO4 concentration Both None

HBr + 2-butanol Increasing 2-butanol concentration Using polar, protic solvent Both None

HBr + 1-butanol Running neat Using a non-protic solvent Both None

* 1. On the Road Again ( 8 pts/ 4 pts per correct path)

Starting from alcohols with <4 Carbons :



1. Suggest a route to :





1. Suggest a route to:

