HOMEWORK ASSIGNMENT #7 ORGANIC CHEMISTRY I (30 pts): **Naming RX; SN2 and SN1 due Wednesday 8 November 2017**

Your name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Provide IUPAC names or the structures for alkyl halides below: (2 pts each/10 pts)









2,2-dibromobicyclo[3.1.0]hexane

2.) Order the reactions below in order from fastest to slowest for SN2 substitution: (2 pts)

\_\_\_\_\_>\_\_\_\_\_>\_\_\_\_\_>\_\_\_\_\_>\_\_\_\_\_

**reaction Substrate solvent nucleophile**

A 2-fluoro-2-methyl propane Methanol Cl-

B 1-iodopropane ethanol methoxide (CH3O-)

C 1-iodoethane CH3CN cyanide (CN-)

D bromomethane methanol I-

E bromomethane DMF F-

3) Name 2 factors influencing the strength of a nucleophile (2 pts)

‑a)

b)

4) Order the reactions below in order from fastest to slowest for SN1 substitution: (2 pts)

\_\_\_\_\_>\_\_\_\_\_>\_\_\_\_\_>\_\_\_\_\_>\_\_\_\_\_

**Reaction Substrate solvent**

A t-butyl-chloride acetone

B ethyl iodide DMF

C t-butyl iodide ethanol

D 2-iodopropane ethanol

E methyl bromide CH3CN

5) Why aren’t the nucleophiles substituting the halides listed above ? (1 pt)

6) Suggest a way to efficiently make diethyl ether from ethyl iodide. (Solvent and nucleophile)

(2 pts)





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7) Circle the feature that doesn’t apply in each line below for SN2 (3 pts)

a) inversion occurs favors 1o and 0o α carbons features intermediate likes aprotic polar solvents

b) best leaving group’s works best with has 5-coordinated rate independent of

source acid has pKa<0 low steric hindrance transition state of nucleophile

c) I->Br->Cl->F- as Nuc- favors 1o and 2o β carbons CH3CN favored over CH3OH strong base is often

in aprotic polar solvent as solvent a good Nuc- for SN2

8) Circle the feature below that doesn’t apply in each line below for SN1 ( 3 pts)

a) racemization occurs runs best with aprotic, polar solvents rate independent of Nuc\_ has intermediate

b) solvolysis happens rate limit is formation of carbocation favors 3o α carbons I- faster than F- as Nuc‑

if no Nuc\_

c) rearrangement possible works best in polar, protic solvents retention of configuration best leaving group’s

source acid’s pKa<0

9) Determine the products of the proposed SN1 reactions below. Make sure to include likely

rearrangement products (5 pts total)

