**CHE2060: Understanding electrophiles & nucleophiles**

NOTE: Please draw Lewis dot structures of all molecules or ions whose structures are not shown and be sure to show all free electron pairs.

**1.** What factors can be used to identify electrophiles and rank their strength?

**2.** What factors can be used to identify nucleophiles and rank their strengths?

**3.** Which would be the best nucleophile and why?

(a) CH3SH

(b) CH3S-

(c) CH3O-

(d) NH3

(e) H2O

**4.** Which is the strongest nucleophile, and why?

(a) CH3SH

(b) CH3SeH

(c) CH3OH

(d) CH3TeH

**5.** Rank these in order of increasing nucleophilic strength.

(a) NH3

(b) H2O

(c) Cl-1

(d) F-1

**6.** Which of these is the ‘best’ nucleophile, and why? *How would you rank the rest?*

(a) CN-1

(b) CH3O-1

(c) OH-1

(d) (CH3)3CO-1

(e) (CH3)2CHO-1

**7.** When looking at a chemical equation or reaction mechanism involving a nucleophile, how can you tell when a nucleophile is acting as a base? (Remember that all bases are Nu: but not all Nu: are bases!)

**8.** Which is not an electrophile?

(a) CH3+1

(b) AlCl3

(c) H+1

(d) (CH3)3N

(e) all of the above

**9.** Which is not an electrophile?

(a) ZnCl2

(b) (CH3)3C+1

(c) H3CCN

(d) BF3

(e) all of the above

**10.** How can a carbonyl group act as either an electrophile or a nucleophile?