

## Answers: NMR Practice Problems

- 1) a. 1-bromopropane would have 3 peaks; 2-bromopropane, only 2  
b. propanal would have 3 peaks; acetone (propanone) would have 1 singlet  
c. the methyl singlet in ethyl acetate would be at ~2 ppm; the methyl singlet in methyl propanoate would be closer to ~3.5 ppm  
d. 1-butyne would have 3 peaks; 2-butyne would have 1 singlet
- 2) a. ~1.2 ppm      b. ~2 ppm      c. ~7ppm      d. ~10 ppm      e. ~5 ppm      f. ~3 ppm
- 3) a. dimethyl ether      b. 2-chloropropane  
c.  $\text{ClCH}_2\text{CH}_2\text{OCH}_2\text{CH}_2\text{Cl}$       d. ethyl acetate or methyl propanoate
- 4) (left) benzaldehyde      (right) phenol
- 5) a. propanoic acid      b. benzyl alcohol  
c. 3-hexene      d. 2-propanol
- 6) a. 1,2-dichloroethane      b. 2,2-dimethoxypropane  
c. 2-bromopropane      d. acetone  
e. 1,1,2-trichloroethane      f. 1-bromopropane
- 7) (top) 3-methyl-3-hydroxy-1-butyne      (middle) 1,4-dimethoxybenzene  
(bottom) 1,2-dibromo-2-methylpropane
- 8) a. 1,1-dimethoxyethane      b. 1-bromo-4-methylbenzene  
c. 1-bromo-2-methylpropane      d. 1-bromo-2-phenylethane
- 9) isopropylbenzene
- 10) (top) 1-chloropropane      (bottom) 4-methoxyacetophenone
- 11) diethylether
- 12) 1,3-dibromopropane
- 13)  $\text{PhCH}_2\text{CH}_2\text{OC}=\text{OCH}_3$
- 14)  $\text{CH}_3\text{CH}_2\text{COCH}_2\text{Cl}$
- 15) 1,3-dibromobutane
- 16) A. 2-methyl-2-butene      B. 2-methyl-1-butene
- 17) 1-propanol
- 18) A. 3-chloro-3-methyl-1-butene or 1-chloro-3-methyl-2-butene  
B. 1-hydroxy-3-methyl-2-butene      C. 3-methyl-3-hydroxy-1-butene