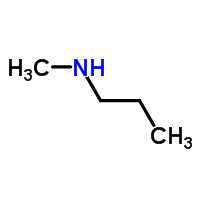
1. Write at least three characteristics of amines that Professor Jablonsky discussed during the lecture. (ex. Hydrogen bonding, geometry, electronegativity etc.)
2. For the following amines, (1) classify, (2) give the common name, and (3) give the IUPAC name.
3. 

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

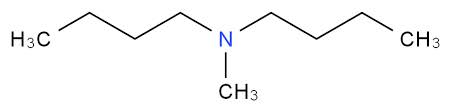
2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. 
2. CH3CH2CH2CH2CH2NH2

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Draw and give the molecular formula for each of the following amines.
2. 2-butanamine
3. N-ethyl-2-pentanamine
4. Pentyl propyl amine
5. **True / False** Amines cannot hydrogen bond to water.
6. **True / False** Primary and secondary amines can hydrogen bond to each other.
7. **True / False** Tertiary amines can hydrogen bond to water.
8. **True / False** Tertiary amines have a higher boiling point than primary and secondary amines.
9. React ethyl amine with water. Then answer the following questions.
10. What type of ion does the amine form?
11. What is the geometry of this ion?
12. React ethyl amine with HBr to form an amine salt.
    1. Reacting the amine salt with a base reverses this back to the neutral amine (the free base). React the product or number 9 with NaOH to do this.
13. Amines are derivatives from **ammonium / ammonia.** 
    1. What is the difference between ammonia and ammonium?
    2. Draw an example of primary, secondary, tertiary, and quaternary ammonium cations.