**Unit 5: Bonding**

**Free Response Review #2**

**Directions:** The suggested time is about 15 minutes for answering the constructed response section of the chemistry test.  The parts within a question may not have equal weight. For calculations, show all your work in the spaces provided after each part. Pay particular attention to the proper use of units.  Be sure your final answer is rounded to the correct number of significant figures.  Make sure your work is legible. Illegible work will receive a grade of zero.

**Question 1 [10 POINTS]** Three substances are listed below. Use your knowledge of chemical bonding and molecular structure to answer the questions that follow.

|  |  |  |
| --- | --- | --- |
| **Substance 1** | **Substance 2** | **Substance 3** |
| KBr | NH3 | CH4 |

1. Describe, in terms of valence electrons, how the chemical bonds form in substance 1. **[2 POINTS]**
2. Describe, in terms of valence electrons, how the chemical bonds form in substance 2. **[2 POINTS]**
3. Are the molecular geometries for substances 2 and 3 the same? Explain. **[2 POINTS]**
4. Would you predict the H—N—H bond angle in substance 2 is larger than, smaller than, or equal to the H—C—H bond angle in substance 3? Explain. **[2 POINTS]**
5. Substance 2 has a boiling point of −33.3oC, whereas substance 3’s boiling point is −161.5oC. Account for the difference in boiling points between the two compounds in terms of intermolecular forces. **[2 POINTS]**