#  October 13, 2009 Test 2 Chemistry 104

**Student’s Name:**

|  |  |  |  |
| --- | --- | --- | --- |
| Answers | Formula if any used | Answers | Formula if any used |
| 1. **B**
 |  | 1. **B**
 |  |
| 1. **A**
 |  | 1. **D**
 |  |
| 1. **B**
 |  | 1. **D**
 |  |
| 1. **C**
 |  | 1. **D**
 |  |
| 1. **D**
 |  | 1. **C**
 |  |
| 1. **D**
 |  | 1. **A**
 |  |
| 1. **C**
 |  | 1. **B**
 |  |
| 1. **C**
 |  | 1. **D**
 |  |
| 1. **D**
 |  | 1. **D**
 |  |
| 1. **B**
 |  | 1. **A**
 |  |
| 1. **D**
 |  | 1. **D**
 |  |
| 1. **B**
 |  | 1. **B**
 |  |
| 1. **D**
 |  | 1. **C**
 |  |
| 1. **A**
 |  | 1. **B**
 |  |
| 1. **A**
 |  | 1. **A**
 |  |
| 1. **D**
 |  | 1. **A**
 |  |
| 1. **D**
 |  | 1. **C**
 |  |
| 1. **C**
 |  | 1. **A**
 |  |
| 1. **B**
 |  | 1. **B**
 |  |
| 1. **C**
 |  | 1. **C**
 |  |

**Short Answers**

**Show all necessary calculations. Include all necessary units. Round answers to the correct number of significant figures. Box final answers.**

1. How many moles of helium are present in a 5.00 L cylinder at a pressure of 3.85 atm and a temperature of 24.0 ºC? (3 pts)

**PV= nRT**

|  |  |
| --- | --- |
| P= | 3.85 atm |
| V= | 5.00 L |
| R= | 0.0821 |
| T= | 24 0C = 297 K |
| n= | ? |

 n= PV/RT = (3.85 atm x 5.00 L) / (0.0821 x 297 K) = **0.789 mol**

2. How much heat energy is necessary to convert 95.0 g of ice at 0 ºC to liquid water at 0 ºC? (heat of fusion of water is 79.7 cal/g) (3 pts)

**Heat =Q= (heat fusion) x mass**

 Q= (79.7 cal/g ) x (95.0 g) = 7571.5 cal ≈**7570 cal**

**3. Draw the structures of the following: (4 pts)**

|  |  |
| --- | --- |
| 2-pentyne |  CH3C≡CCH2CH3 |
| *meta*-diethylbenzene | I can’t draw it here (benzene ring with 2 ethyl groups –CH2CH3) on a 1,3 positions. |

4. **Sketch the structural formula for each of the following. Determine the molecular geometry and molecular polarity and the formal charge of each of the atom present. (6pts)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Formula** | **Lewis Structure** | **Formal charge of each atom** | **Molecular Geometry** | **Molecular Polarity** |
| CSe2 |  Se=C=Se | C: 0Se: 0 |  Linear | Nonpolar |
| NO2- |  O=N-O | N: 0O: 0O:-1 | Bent | Polar |
| NF3 |  F – N – F F | N: 0F: 0 | Trigonal pyramidal | Polar |