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**Worksheet 5**

1. Which of the following elements shows the greatest degree of electron shielding? Explain your answers.
   1. Ba or Sr
   2. P or Cl
   3. Zn or Hg
2. Which of the following shows the greater nuclear charge? Explain.
   1. Y or Nb
   2. Cs or Tb
   3. Cl or I
3. Calculate the mass of water produced when 100 grams of sodium bicarbonate decomposes according to the reaction: NaHCO3 🡪 Na2CO3 + H2O + CO2 **(10.71 g)**
4. Determine the types of intermolecular forces present in the following molecules. Then determine which molecule would have the greatest viscosity and why.
   1. C6H14, NF3, Ar, H2O
5. Which of the following molecules would be polar? C14H30, C14H29OH, BH3, PCl3, HF
6. Calculate the energy change which occurs for the following equation using Hess’ Law: **(-136.8 kJ)**

C2H4 (g) + H2 (g) ® C2H6 (g)

|  |  |
| --- | --- |
| C2H4 (g) + 3 O2 (g) 🡪 2 CO2 (g) + 2 H2O (l) | DH = -1411. kJ |
| C2H6 (g) + 3½ O2 (g) 🡪 2 CO2 (g) + 3 H2O (l) | DH = -1560. kJ |
| H2 (g) + ½ O2 (g) 🡪 H2O (l) | DH = -285.8 kJ |

1. A mixture of three gases exerts a total pressure of 29.3 atm. If the pressure from gas A is 13 atm and the pressure from gas B is 1160 torr, what would be the pressure (in atm) from gas C? **(14.77 atm)**
2. 200 ml of a gas is collected over water at a pressure of 1.9 atm and 30 ⁰C. What volume would this gas occupy at 3.5 atm, if temperature remains unchanged? The vapor pressure of water is 0.042 atm at 30 degrees. **(106 ml)**
3. Calculate the specific heat of substance X if 100 grams of this substance changes temperature by 15 degrees after receiving 7200 J of energy. **(4.8 J/g 0C)**