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## Unit 1: Gases Discussion Worksheet #1, Stoichiometry and Pressure

**Show all work for credit. Your work and answers must fit in the boxes or diagrams provided for each question.**

**Part I:**

1. 40.0 grams of A (60.0 g/mol) react with 35.0 grams of B (40.0 g/mol) to form C (37.0 g/mol) and D (75.0 g/mol) according to the following equation:

$$3\,A + 2\,B \rightarrow 5\,C + 1\,D$$

Which reactant is the limiting reactant? (Show the work used to make this determination in the box and then circle your answer.)

$$40.0\text{ g A} \left|\frac{1\text{ mol A}}{60.0\text{ g A}}\right|\frac{1\text{ mol D}}{3\text{ mol A}}\left|\frac{75.0\text{ g D}}{1\text{ mol D}}\right. = \frac{3000}{180} = 16.7\text{ g D}$$

$$35.0\text{ g B} \left|\frac{1\text{ mol B}}{40.0\text{ g B}}\right|\frac{1\text{ mol D}}{2\text{ mol B}}\left|\frac{75.0\text{ g D}}{1\text{ mol D}}\right. = \frac{2625}{80} = 32.8\text{ g D}$$

The limiting reactant is (circle one): (A) B C D

2. For the reaction in #1, what is the maximum number of grams of D that can be produced? Again, show your work and put your final answer in the spaces in the lower right corner.

$$40.0\text{ g A} \left|\frac{1\text{ mol A}}{60.0\text{ g A}}\right|\frac{1\text{ mol D}}{3\text{ mol A}}\left|\frac{75.0\text{ g D}}{1\text{ mol D}}\right. = \frac{3000}{180} = 16.7\text{ g D}$$

Answer: 16.7 g D

3. For the reaction in #1, how many grams of excess reactant are left over at the completion of the reaction? Again, show your work and put your final answer in the spaces in the lower corner.

$$16.7\text{ g D} \left|\frac{1\text{ mol D}}{75.0\text{ g D}}\right|\frac{2\text{ mol B}}{1\text{ mol D}}\left|\frac{40.0\text{ g B}}{1\text{ mol B}}\right. = \frac{1336}{75} \approx 17.8\text{ g B}$$

$$35.0\text{ g B} - 17.8\text{ g B} = 17.2\text{ g B}$$

Answer: 17.2 g of B