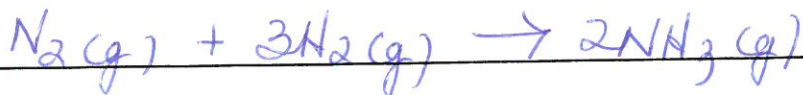


Nitrogen reacts with hydrogen to produce ammonia gas.

Write the BCE for the above reaction with the proper subscripts.



Confirm this with someone!

A) How many moles of ammonia will be formed if 5 moles of nitrogen react?

$$5 \text{ mol N}_2 \times \frac{2 \text{ mol NH}_3}{1 \text{ mol N}_2} = 10 \text{ mol NH}_3$$

B) How many moles of hydrogen will react to form 1.33 moles of ammonia?

$$1.33 \text{ mol} \times \frac{3 \text{ mol H}_2}{2 \text{ mol NH}_3} = 0.67 \text{ mol H}_2$$

C) What mass of hydrogen is required to react with 4 moles of nitrogen?

$$4 \text{ mol N}_2 \times \frac{3 \text{ mol H}_2}{1 \text{ mol N}_2} \times \frac{2 \text{ g H}_2}{1 \text{ mol H}_2} = 24 \text{ g H}_2$$

D) If 7 moles of hydrogen react with excess nitrogen, what mass of ammonia will form?

$$7 \text{ mol H}_2 \times \frac{2 \text{ mol NH}_3}{3 \text{ mol H}_2} \times \frac{17 \text{ g NH}_3}{1 \text{ mol NH}_3} = 79.3 \text{ g NH}_3$$

E) If 55.00 g of nitrogen react, what mass of ammonia will form?

$$55.00 \text{ g N}_2 \times \frac{1 \text{ mol N}_2}{28 \text{ g N}_2} \times \frac{2 \text{ mol NH}_3}{1 \text{ mol N}_2} \times \frac{17 \text{ g NH}_3}{1 \text{ mol NH}_3} = 66.8 \text{ g NH}_3$$

F) If 45.00 g of hydrogen react, how many grams of nitrogen are needed?

$$45.00 \text{ g H}_2 \times \frac{1 \text{ mol H}_2}{2 \text{ g H}_2} \times \frac{1 \text{ mol N}_2}{3 \text{ mol H}_2} \times \frac{28 \text{ g N}_2}{1 \text{ mol}} = 210 \text{ g N}_2$$

G) If 10.00 g of ammonia is formed, how many atoms of nitrogen were used?

$$10.00 \text{ g NH}_3 \times \frac{1 \text{ mol NH}_3}{17 \text{ g NH}_3} \times \frac{1 \text{ mol N}_2}{2 \text{ mol NH}_3} \times \frac{6.02 \times 10^{23} \text{ molecules N}_2}{1 \text{ mol}} \times \frac{2 \text{ atoms N}}{1 \text{ molecule N}_2} = 3.54 \times 10^{23} \text{ atoms N}$$