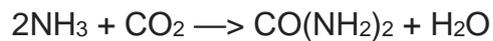


Ammonia can be reacted with carbon dioxide to form urea, as shown below. If 170 g ammonia were consumed in a reaction with excess carbon dioxide, what mass of urea could be produced?

The molar mass of ammonia is 17g/mole and that of urea is 60g/mole.



Solution:

$$1. n = \frac{m}{M};$$

$$n(\text{NH}_3) = \frac{170 \text{ g}}{17 \text{ g/mole}} = 10 \text{ mole.}$$

2. $n(\text{CO}(\text{NH}_2)_2) = \frac{1}{2} \times n(\text{NH}_3)$. It is from the equation of reaction;

$$n(\text{CO}(\text{NH}_2)_2) = \frac{1}{2} \times 10 \text{ mole} = 5 \text{ mole};$$

$$3. m = n \times M;$$

$$m(\text{CO}(\text{NH}_2)_2) = 5 \text{ mole} \times 60 \frac{\text{g}}{\text{mole}} = 300 \text{ g.}$$

Answer: $m(\text{CO}(\text{NH}_2)_2)$ is 300 gram.