Answer on Question #60915 - Chemistry | General Chemistry

Given the following reactions what mass of water will be formed if you react 2.85g NH_3 with excess O_2

$NH_3+O_2=NO+H_2O$

Solution

$$4NH_3 + 5O_2 = 4NO + 6H_2O$$

$m(NH_3)=2.85$ (g)

$M(NH_3) = 17.031$ (g/mol)

$$n(NH_3) = \frac{m}{M} = \frac{2.85\ g}{17.031\ g/mol} = 0.1673\ (mol)$$

The ratio between NH_3 and H_2O is 4:6

$$n(H_2O) = n(NH_3) \cdot \frac{6}{4} = 0.1673(mol) \cdot \frac{6}{4} = 0.2509\ (mol)$$

$M(H_2O) = 18$ (g/mol)

$m(H_2O) = M \cdot n = 0.2509 \cdot 18 = 4.5$ (g)

Answer

$m(H_2O) = 4.5$ (g)