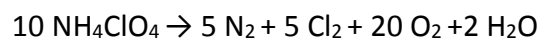


## Answer on Question #63699, Chemistry / General Chemistry

Ammonia perchlorate ( $\text{NH}_4\text{ClO}_4$ ) is solid rocket fuel. It reacts with itself to produce nitrogen gas ( $\text{N}_2$ ), chlorine gas ( $\text{Cl}_2$ ), oxygen gas ( $\text{O}_2$ ) water ( $\text{H}_2\text{O}$ ) and a great deal of energy. What mass of chlorine gas is produced by the reaction of 1.26g of ammonia perchlorate?

### Solution



$$n(\text{NH}_4\text{ClO}_4) = \frac{m(\text{NH}_4\text{ClO}_4)}{M(\text{NH}_4\text{ClO}_4)}$$

$$n(\text{NH}_4\text{ClO}_4) = \frac{1.26 \text{ g}}{117.49 \text{ g/mol}} = 0,1072 \text{ mol}$$

$$n(\text{Cl}_2) = n(\text{NH}_4\text{ClO}_4) \cdot \frac{5}{10} \text{ (from the equation of the reaction)} = 0,0053 \text{ mol}$$

$$m(\text{Cl}_2) = n(\text{Cl}_2) \cdot M(\text{Cl}_2) = 0,0053 \cdot 70,9060 = 0,3802 \text{ g}$$

**Answer:**  $m(\text{Cl}_2) = 0,3802 \text{ g}$ .