

### Question #64850, Chemistry / General Chemistry

Stoichiometry--  $2\text{Al} + 3\text{I}_2 \rightarrow 2\text{AlI}_3$

2. If, in the balanced reaction above, I want to produce 105.0 g of  $\text{AlI}_3$ , how many grams of  $\text{I}_2$  will I need? (MM of  $\text{AlI}_3 = 407.7\text{ g/mol}$  and MM of  $\text{I}_2 = 253.8\text{ g/mol}$ )

**Answer:**

$$\begin{aligned}n(\text{I}_2) &= \frac{3}{2}n(\text{AlI}_3) \\m(\text{I}_2) &= n(\text{I}_2) \times M(\text{I}_2) \\n(\text{AlI}_3) &= \frac{m(\text{AlI}_3)}{M(\text{AlI}_3)} \\m(\text{I}_2) &= \frac{3}{2} \times \frac{m(\text{AlI}_3)}{M(\text{AlI}_3)} \times M(\text{I}_2) \\m(\text{I}_2) &= \frac{3}{2} \times \frac{105.0\text{ g}}{407.7\frac{\text{g}}{\text{mol}}} \times 253.8\frac{\text{g}}{\text{mol}} = \mathbf{98.05\text{ g}}\end{aligned}$$

Answer provided by <https://www.AssignmentExpert.com>