Answer to the Question #62694, Chemistry / General Chemistry

How many L STP of oxygen are needed to produce 45.0 grams of nitric oxide according to the following balanced equation?

$$4NH_{3}+5O_{2}=4NO+6H_{2}O$$

$$5 \cdot n (O_{2}) = 4 \cdot n (NO)$$

$$V(O_{2}) = n (O_{2}) \cdot V_{m}$$

$$V_{m} = 22.4L/mol (STP)$$

$$n (O_{2}) = \frac{5 \cdot n (NO)}{4}$$

$$n (NO) = \frac{m(NO)}{M(NO)}$$

$$M(NO) = 30g/mol$$

$$V(O_{2}) = \frac{4 \cdot m (NO)}{5 \cdot M(NO)} \cdot V_{m}$$

$$V(O_{2}) = \frac{5 \cdot 45 \cdot 22.4}{4 \cdot 30} = 42L$$