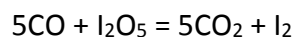


### Answer on the Question #66593, Chemistry / General chemistry

In testing a respirator, 2.00g of carbon monoxide gas is passed through diiodine pentoxide. How much iodine, in grams, should theoretically be produced?

#### Solution:

Chemical reaction between the carbon monoxide and diiodine pentoxide:



The mol number of the carbon monoxide:

$$n(\text{CO}) = \frac{m(\text{CO})}{M(\text{CO})} = \frac{2.00\text{g}}{28\text{g/mol}} = 0.07\text{ mol}$$

The ratio of  $\text{CO}:\text{I}_2 = 5:1$ , that is why the mol number of  $\text{I}_2$  equal to:

$$n(\text{I}_2) = \frac{1}{5}n(\text{CO}) = \frac{1}{5} \cdot 0.07\text{ mol} = 0.014\text{ mol}$$

Theoretical mass of the iodine  $\text{I}_2$  can be predicted by the equation:

$$m(\text{I}_2) = n(\text{I}_2) \cdot M(\text{I}_2) = 0.014\text{ mol} \cdot 254 \frac{\text{g}}{\text{mol}} = 3.6\text{ g}$$

**Answer:** the iodine mass is 3.6 g.