

Answer on Question #72046, Chemistry / General Chemistry

What mass of water, in grams, would have to be decomposed to produce 23.3 L of molecular oxygen at STP?

Solution

Volume of 1 mole of gas is 22.4 L at STP.

Find what amount of oxygen have to be produced:

$$v = \frac{23.3}{22.4} = 1,04 \text{ mole}$$

$2\text{H}_2\text{O} \rightarrow 2\text{H}_2 + \text{O}_2$, or 2 moles of water gives 1 mole of oxygen;

1.04 mole of oxygen is given by 2.08 mole of water.

Find the mass of water:

$$m = 2.08 \times 18 = \mathbf{37.44 \text{ (g)}}$$

Answer

37.44 (g) would have to be decomposed to produce 23.3 L of molecular oxygen at STP?