

## Answer on Question #56881 – Chemistry - General Chemistry

### Question:

An oxygen enriched air, which contains at least 50% by volume pure oxygen, has been sold by a company. To test their claim, a 1000 mL glass bulb was filled with the gas to a total pressure of 750 mm Hg at 68°F. The weight of the gas sample was found to be 1.236 g. What is the exact volume percent of oxygen gas in the mixture?

### Answer:

$$68^{\circ}\text{F}=293.15\text{ K}$$

$$R=62.364\text{ (mm}\cdot\text{l)}\text{/}(\text{mol}\cdot\text{K})$$

We will assume the 50% of the volume is occupied by  $\text{O}_2$  and other 50% - by  $\text{N}_2$ .

$$M(\text{O}_2)=32\text{ g/mol}$$

$$M(\text{N}_2)=28\text{ g/mol}$$

$$pV = vRT$$

$$750 \cdot 0.5 = \frac{m}{32} \cdot 62.364 \cdot 293.15$$

$$m(\text{O}_2) = 0.6564\text{ g}$$

$$750 \cdot 0.5 = \frac{m}{28} \cdot 62.364 \cdot 293.15$$

$$m(\text{N}_2) = 0.5743\text{ g}$$

$$m=0.6564+0.5743=1.2307$$

If 50%-Oxygen air weigh 1.236 g, than the amount of Oxygen in the current sample is:  
 $(1.237 \cdot 50)/1.236=50.215\%$

Which is very close to the started value.