## Answer on Question #41776 - Chemistry - Inorganic Chemistry

**Question:**

600 ml of ozonised oxygen at STP was found to weight one gram. What is the volume of O3 in the ozonoised oxygen ?

(1) 200 ml

(2) 150 ml

(3) 100 ml

(4) 50 ml

**Answer:**

From the ideal gas law we can find the expression for the molar mass:

$pV = nRT$

$n = m/M$

$pV = mRT/M$

$M = mRT/pV = 1 \cdot 8.314 \cdot 273/(100000 \cdot 0.0006) = 37.8$ g/mol

$M(O_3) = 48$

$M(O_2) = 32$

The average molar mass of gas can be expressed as the sum of molar masses multiplied by mole fraction. Let x denote the mole fraction of ozone, so the mole fraction oxygen is 1-x. Now we can write the expression for x:

$48x + 32(1-x) = 37.8$

$x = 0.3625$

The volume of ozone is the total volume multiplied by the ozone mole fraction:

$V(O_3) = x \cdot V = 217.5$ ml $\approx 200$ ml

**So, the correct option is (1).**