Answer on Question #63911 - Chemistry - General Chemistry

Question: $2KClO_3$ —> $2KCl + 3O_2$ What is the theoretical yield of oxygen when 5g of $KClO_3$ decomposes

Solution

If we assume that potassium chlorate fully decomposes, then all the oxygen present in the salt is converted into O_2. So we don't even have to calculate the amount of oxygen according to the reaction equation, but can simply find the weight percentage of oxygen in the salt and multiply it by the mass of the salt.

1) find the weight percentage of oxygen in the salt: $\omega(O) = \frac{3*16}{39.1+35.5+3*16} = 0.3915$

2) find the mass of oxygen produced by decomposition of 5 grams of potassium chlorate: $m(O_2) = \omega(O) * m(KClO_3) = 0.3915 * 5 = 1.9576\ g$

Answer: the theoretical yield of oxygen when 5g of $KClO_3$ decomposes is 1.9576g.