Answer on Question #43255 - Chemistry - Other

Question:

There is a iodine oxide which has 254 grams Iodine & 80 grams oxygen so what's the formula of this molecular?

Solution:

1) Find amount of substance of Iodine atoms in the iodine oxide:
$$n(\mathrm{I}) = \frac{m(\mathrm{I})}{M(\mathrm{I})} = \frac{254\ g}{127\ \frac{g}{mol}} = 2\ mol$$
2) Find amount of substance of Oxygen atoms in the iodine oxide:
$$n(\mathrm{O}) = \frac{m(\mathrm{O})}{M(\mathrm{O})} = \frac{80\ g}{16\ \frac{g}{mol}} = 5\ mol$$
3) As a result, the molar ratio of Iodine and Oxygen in iodine oxide is 2 : 5 correspondingly, that means that there are 2 atoms of Iodine and 5 atoms of Oxygen in 1 molecule of iodine oxide.
4) The molecular formula of iodine oxide is $\mathrm{I_2O_5}$.

Answer: $\mathrm{I_2O_5}$