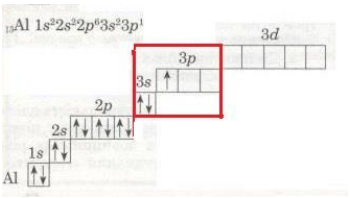
Question:

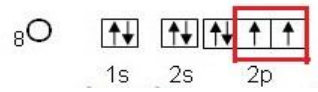
$4Al + 3O_2 \rightarrow 2Al_2O_3$
How does $4Al+3O_2$ turn into $2Al_2O_3$? WHat type of dividing is going on? Shouldn't it be $4Al3O_2$? (the original problem was to make $Al+O_2$ into a balanced equation, and I understood it until that last part.) I know it has something to do with the fact that the charge of Al is +3 and the charge of O is -2 but I don't know what to do with that. Is +3 and -2 supposed to add up to something? Sorry I'm just really confused.

Solution:

Al is a metal. It is chemical element with atomic number 13.Al combines easy with O_2.It is formed oxide. This is a coupling reaction(A+B=AB).Al has constant valence III,because Al has three valence electrons at the external energy level:



Also Oxygen has constant valence II,because Oxygen has two valence electrons at the external energy level:



I find least common multiple numbers 3 and 2(3 and 2 is valence Al and O).It equals 6. I will divide 6 by 3 and I will get 2.It is index near Aluminum.I will divide 6 by 2 and I will get 3.It is index near Oxygen.So,Al_2O_3.

$Al+O_2=Al_2O_3$

I must balance the equation. The number of Aluminum atoms on the left side should correspond to the number of Aluminum atoms in the right side.The number of Oxygen atoms on the left side should correspond to the number of Oxygen atoms in the right side.

$4Al + 3O_2 \rightarrow 2Al_2O_3$.

Answer: