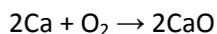


Calcium metal required 1 gram of oxygen for its conversion to 3.5 grams of CaO. Prove that this reaction is in accordance with the law of constant proportion.

Answer: Equation of the chemical reaction between calcium and oxygen is:



According to this reaction, one mole of oxygen is needed to produce 2 moles of calcium oxide, or, in grams it is 32 grams of oxygen and $56 \cdot 2 = 112$ grams of calcium oxide. Ratio between these two masses is theoretical (predicted from the reaction equation): $m(\text{CaO})/m(\text{O}_2) = 112/32 = 3.5$;

And the ratio between experimentally obtained masses is: $m'(\text{CaO})/m'(\text{O}_2) = 3.5/1 = 3.5$

As you see, these ratios are equal; it means that this reaction is in accordance with the law of constant proportion, which states that every pure chemical compound always contains same elements combined together in the same proportion by mass regardless of the obtaining method.