2 C8H18 + 25 O2 ———> 16 CO2 + 18 H2O

If 114 g of C8H18 used in the above reaction, how many grams of O2 would be needed for complete reaction?

Solution. Find the amount of octane substance: $n(C_8H_{18})=\frac{m(C_8H_{18})}{M(C_8H_{18})}$, where $m(C_8H_{18})$ – mass of octane, g, $m(C_8H_{18})$=114g; $M(C_8H_{18})$ – molar mass, g/mol, $M(C_8H_{18})$=114 g|mol. Then: $n(C_8H_{18})=\frac{114}{114}$=1 mol. According to the reaction equation, the amount of oxygen substance is a number greater than the amount of octane substance in $\frac{25}{2}=12.5$ time. Then, $n(O_2)=12.5\times n(C_8H_{18})=12.5\times 1=12.5$ moles. $m(O_2)=n(O_2)\times M(O_2)=12.5\times 32=400$ g.
Answer: 400 g O_2.