How many moles of oxygen are needed to produce 25.4 moles of carbon dioxide?

Data:

ν (CO_2) – 25,4 moles

ν (O_2) - ?

In order to find amount of oxygen substance we have to write a chemical reaction between carbon and oxygen and to make a proportion, where x – is a number of oxygen moles:

$$\underset{1\,mole}{C} + \underset{1\,mole}{\overset{x\,moles}{O_2}} = \underset{1\,mole}{\overset{25,4\,moles}{CO_2}}$$
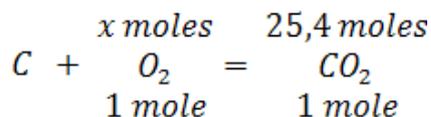
Solving the proportion:

$$x = \frac{1\,mole * 25,4\,moles}{1\,mole}$$

$$x = 25,4\,moles$$

The solution: $25,4\,moles$ of oxygen are necessary for producing 25.4 moles of carbon dioxide.