How many grams of $CaCO_3$ are needed to produce 1 mole of CO_2 via the reaction below?

$CaCO_3(s) \longrightarrow CaO(s) + CO_2(g)$

Solution:

Coefficients in equation for $CaCO_3$ and CO_2 are equal to 1. Then, each mole of $CaCO_3$ produces 1 mole of CO_2 and amount of moles of $CaCO_3$ is equal to amount of moles of CO_2. According to this, we need to find a mass of 1 mole of $CaCO_3$ to solve this task:

$m(CaCO_3)= M(CaCO_3)*n(CaCO_3)=(40+12+16*3)$ g/mol *1 mol=100 g

(Where m is mass of $CaCO_3$ in grams; M – molar mass of $CaCO_3$ in grams per mole; n – number of moles of $CaCO_3$).

Answer:

To obtain 1 mole of CO_2, we need to use 100 grams of $CaCO_3$.

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