NTP - Normal Temperature and Pressure - is defined as air at 20°C (293.15 K, 68°F) and 1 atm (101.325 kN/m², 101.325 kPa

This task can be solved by using Ideal gas law. The ideal gas law is the equation of state of a hypothetical ideal gas. It is a good approximation to the behaviour of many gases under many conditions, although it has several limitations. The ideal gas law is often introduced in its common form:

$$PV = nRT$$

where *P* is the pressure of the gas, *V* is the volume of the gas, *n* is the amount of substance of gas (also known as number of moles), *T*is the temperature of the gas and *R* is the ideal, or universal, gas constant, equal to the product of the Boltzmann constant and the Avogadro constant.

In SI units, *P* is measured in pascals, *V* is measured in cubic metres, *n* is measured in moles, and *T* in kelvin (273.15 Kelvin = 0.00 degrees Celsius). R has the value $8.314 J \cdot K^{-1} \cdot mol^{-1}$ or $0.08206 \ L \cdot atm \cdot mol^{-1} \cdot K^{-1}$ if using pressure in standard atmospheres (atm) instead of pascals, and volume in liters instead of cubic metres.

NTP - Normal Temperature and Pressure - is defined as air at 20°C (293.15 K, 68°F) and 1 atm (101.325 kN/m², 101.325 kPa.

For answering this task you need to find amount of CO_2:

PV=nRT

n = PV/RT

n = 101.325 * 0. 112 / 8.31* 293. 15 = 0,00466 moles

The equation for reaction is next:

$CH_4+2\ O_2 = CO_2+2H_2O$

Amount ratio between CH_4, O_2 and CO_2 is 1:2:1

The mass can be found from:

n = m/Mw, where n is amount, Mw is molecular mass

m = n*Mw

For **CH_4** amount is equal to CO_2 amount:

m = 0,00466 * 16 = **0,0745g**

For **O_2** amount is equal to 2* CO_2 amount:

m =2* 0,00466 * 32 = **0,2982g**