

$$\text{Moles} = \frac{\text{mass}}{\text{RMM}}$$

$$\text{Moles} = \frac{703}{144}$$

$$\text{Moles} = 6.166$$

\therefore There are 6.166 moles of octane used when 1L of petrol is burned



Moles of carbon dioxide produced

Relative molecular mass:

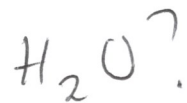
Mass of carbon = 12

Mass of oxygen = 16

$$(1 \times 12) + (2 \times 16)$$

$$= 12 + 32$$

$$= 44 \text{ g}$$



The moles for octane will be multiplied by 8 because 1 mole of octane produces 8 moles of carbon dioxide.

Convert to grams

$$\text{mass} = n \times M$$

$$\text{mass} = (6.166 \times 8) \times 44$$

$$\text{mass} = 2170.66 \text{ g}$$

$$\text{mass} = 2.17 \text{ kg}$$

\therefore There is 2.17 kg of CO_2 released per litre of petrol

Moles of water vapor produced

Relative molecular mass:

Mass of hydrogen = 1

Mass of oxygen = 16

$$(2 \times 1) + (1 \times 16)$$

$$= 2 + 16$$

$$= 18 \text{ g}$$