Coal - C - combustion: 6.5 Calories / gram

$$C + O_2 \rightarrow CO_2 \tag{1}$$

Atomic weight of...

- 1 mole of coal = 1 mole of C = **12g**
- 1 mole of carbon dioxide = **1 mole of C*(12 g /mole of C) + 2 moles * (16 g / mole of O)= 44 g / mole of CO_2.**

We want grams of CO_2 / Calorie:

$$\frac{[\quad]\text{g } CO_2}{[\quad]\text{g } C} * \frac{1\text{g } C}{6.5\text{cal}} = [\quad]\text{g of } CO_2 / \text{ 1 Calorie.} \tag{2}$$

Gasoline (av. octane) - C_8H_{18} - combustion: 10.8 Calories / gram

$$2\,C_8H_{18} + 25\,O_2 \rightarrow 16\,CO_2 + 18\,H_2O \tag{4}$$

1 mole of C_8H_{18} weighs 8*(12 g/mole of C)+18*(1 g/ mole of H)=96+18=114 g / mole. So...

Atomic weight of...

- 2 moles of octane molecules = ?? **2 moles * 114 g/ mole of octane = 228 grams**
- 16 moles of carbon dioxide molecules = **16 moles * 44 g / mole of CO_2 = 704 g**

So, **704** g of CO_2 are produced for every **228** g of gasoline

We want grams of CO_2 / Calorie:

$$\frac{[\mathbf{704}]\text{ g } CO_2}{[\mathbf{228}]\text{ g } gasoline} * \frac{1\text{ g } gasoline}{10.8\text{Cal}} = [\quad]\text{grams of } CO_2 / \text{ 1 Calorie.} \tag{5}$$

$$\frac{704 * 1}{228 * 10.8} = 0.29\text{g of } CO_2 / \text{ 1 Calorie.} \tag{6}$$

Natural gas (methane) - CH_4 - combustion: 13.3 Calories / gram

$$CH_4 + 2\,O_2 \rightarrow CO_2 + 2\,H_2O \tag{7}$$

Atomic weight of...

- 1 methane = ? =
- 1 carbon dioxide = ?

So, ____ g of CO_2 are produced for every ____g of methane :

We want grams of CO_2 / Calorie: