W1.29

Combustion reactions and heat released

Sr No	Combustible gas/material	Reaction formula	Heat released kcal/kmol	
1	Carbon	$C + O_2 = CO_2$	97200	
	burnt to CO_2	$12kg\ C + 32\ kg\ O_2 = 44kg\ CO_2$ $12kg\ C + 22.4NM^3O_2 = 22.4NM^3\ CO_2$		
2	Carbon	$2C + O_2 = 2CO$	29200	
	burnt to CO	$12kg\ C + 16\ kg\ O_2 = 28\ kg\ CO$ $12kg\ C + 11.2NM^3\ O_2 = 22.4\ NM^3\ CO$		
3	Hydrogen	$2H_2 + O_2 = 2H_2O$	57600	
		$2kgH_2 + 16kgO_2 = 18\ kg\ H_2O$ $22.4NM^3H_2 + 11.2\ NM^3\ O_2 = 22.4NM^3H_2O$		
4	Sulphur	$S + O_2 = SO_2$	80000	
		$32kgS + 32kg\ O_2 = 64\ kg\ SO_2$ $32kgS + 22.4NM^3\ O_2 = 22.4\ NM^3\ SO_2$		
5	Carbon Monoxide	$2CO + O_2 = 2CO_2$ $2*(12kg\ C+16\ kgO_2)+32kgO_2 = 2*(12\ kgC+32kgO_2)$	68000	
	burnt to CO_2	$56kg\ CO + 32\ kg\ O_2 = 88kg\ CO_2$ $56\ kg\ CO + 22.4\ NM^3\ O_2 = 2*\ 22.4\ NM^3\ CO_2$		
5	Methane	$CH_4+2O_2 = CO_2 + 2H_2O$	191000 L 213500 H	low high
		$16kgCH_4 + 64kgO_2 = 44kgCO_2 + 36\ kgH_2O$ $22.4NM^3CH_4 + 44.8NM^3O_2 = 22.4NM^3CO_2 + 44.8NM^3H_2O$		

source : Onoda Manual

*****