Question #75774, Chemistry / Physical Chemistry / Completed

The standard enthalpies of formation of $CO_2(g)$,$H_2O(l)$ and glucose (s) at 25°C are-400kJ,-300 kJ/mol and-1300kJ/mol, respectively. The standard enthalpy of combustion per gram of glucose at 25°C is

(1)2900kJ

(2)-2900kJ

(3)-16.11 kJ

(4)16.11kJ

Solution:

$C_6H_{12}O_6 + 6O_2 = 6CO_2 + 6H_2O$

$6(-400) + 6(-300) – (-1300) = -2400 – 1800 + 1300 = -2900$ kJ/mol

M = 180 g/mol

$-2900/180 = -16.11$ kJ/g

Answer: (3) -16.11 kJ/g.