**Alcohol Fermentation**

Alcohol fermentation is a type of *respiration* in *cells*.

In the cells of an organism, glucose (sugar), water (H2O) and oxygen (O2) are *reacted* to produce carbon dioxide (CO2) and water (H2O). This is called ***cellular respiration***. In the process, energy is *released* which is used by our body to function. The *chemical equation* for cellular respiration is:

Cellular respiration: C6H12O6 + 6 O2 + 6 H2O 6 CO2 (g) + 12H2O(l)

Cellular respiration is done by all cells including *yeast cells*. Without oxygen, yeast cells can still produce energy by *converting* glucose into ethanol. This process is called ***anaerobic*** (without oxygen) ***respiration***. The products of this reaction are ethanol (CH3CH2OH), carbon dioxide (CO2) and water (H2O). In this type of respiration, only 5% of the energy won through cellular respiration can be *gained.*

Anaerobic respiration: C6H12O6 + yeast 2 C2H5OH + 2 CO2 + H2O H = -105kJ/mol

Alcohol can therefore be produced from juices of fruits or vegetables high in *sugar content* by adding yeast to them. To isolate the ethanol from the *reaction mixture*, it has to be distilled. This ethanol can then be used to *power* our cars. The energy *contained* when burning ethanol is as high as the energy needed to produce it. Therefore, the energy balance of ethanol is positive. Additionally, ethanol has lower CO2 *emissions* than *gasoline*.

**Questions**

1. C:\Users\Jana_User\AppData\Local\Microsoft\Windows\Temporary Internet Files\Content.IE5\GZ0O8FHI\MC900438012[1].wmfHow much energy is released when 10 mol of glucose react to form water and carbon dioxide during **cellular respiration**? (HAnaerobic respiration = -105kJ/mol)