

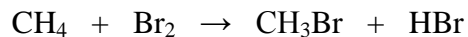
QUESTION ONE

(a) Draw Lewis Structures for the following molecules.

Molecule	Lewis Structure
Hydrogen Sulfide H ₂ S	
Phosphorus Trichloride PCl ₃	
Methanal CH ₂ O	

QUESTION TWO

- (a) Methane reacts with bromine to form bromomethane and hydrogen bromide as shown in the equation below.

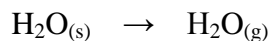


In this reaction some bonds are broken, some are formed. State which bonds are broken and which are formed.

Bonds broken: _____

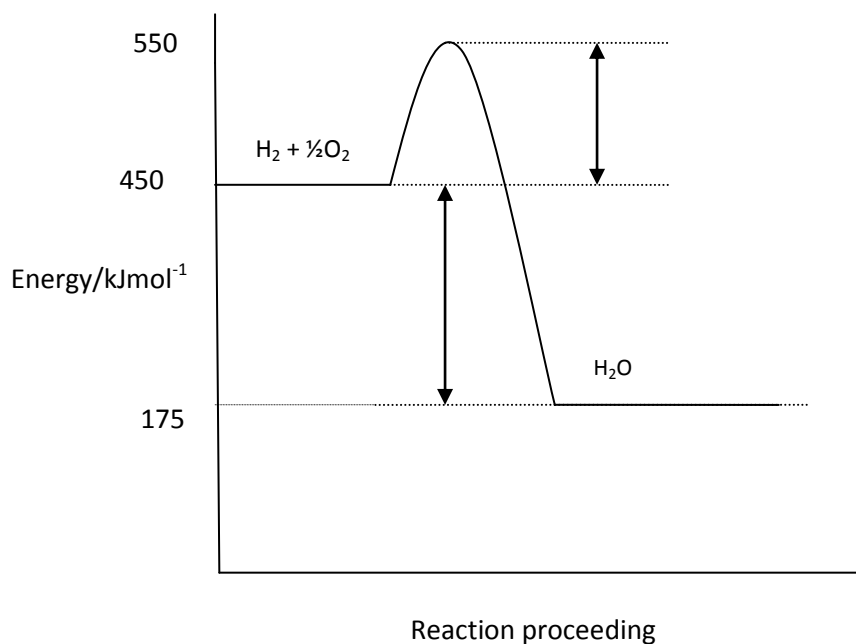
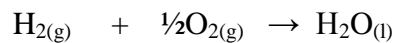
Bonds formed: _____

- (b) On top of very high mountains, solid water, in the form of ice, sublimes. This is represented by the following equation.



Is this reaction endothermic or exothermic? Explain your answer.

- (c) The following diagram is an energy diagram for the reaction between hydrogen and oxygen to produce water. An equation for the reaction is



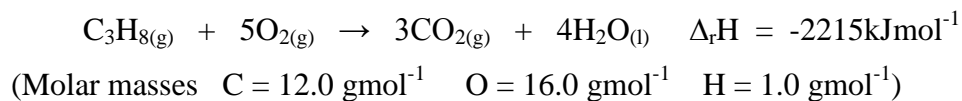
Using the diagram calculate a value for $\Delta_r\text{H}$ for the reaction.

$$\Delta_r\text{H} = \text{_____} \text{ kJmol}^{-1}$$

- (d) Use your answer to part (c) to calculate the energy change when 3.47 mol of water is formed.

- (e) Is the energy in part (d) absorbed or released. Explain your answer.

- (f) The amount of energy released when 110g of propane (C_3H_8) burns completely in oxygen is 5537kJ. Calculate Δ_rH for this reaction.



QUESTION THREE

- (a) Complete the table below. For each substance listed name the particles which make up the **solid** form of the substance and the types of attractive force which hold the particles together in the solid structure.

Substance	Particles	Attractive force between particles
Carbon dioxide		
Graphite		
Magnesium Chloride		
Silicon		

