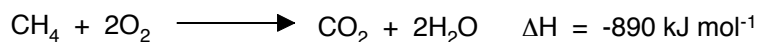


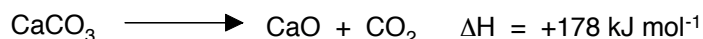
Chemguide – questions

AN INTRODUCTION TO CHEMICAL ENERGETICS

1. Methane burns in oxygen to give carbon dioxide and water. During the process, energy is given off as heat.



- a) Show this change on a simple energy diagram as on the page you have just read.
- b) A reaction in which heat is evolved is called an exothermic change. How can you tell from the equation that the change is exothermic?
- c) During any chemical reaction, old bonds are broken and new ones made. Explain how this breaking and making of bonds leads to the change being exothermic.
- d) A mixture of methane and oxygen at room temperature is said to be thermodynamically unstable with respect to carbon dioxide and water, but kinetically stable. Explain what this means, and how it is possible.
2. On strong heating, calcium carbonate decomposes to give calcium oxide and carbon dioxide.



- a) What name is given to a reaction in which heat is absorbed?
- b) Show this change on a simple energy diagram.
- c) Which is more energetically stable - the calcium carbonate or the calcium oxide and carbon dioxide mixture formed during the reaction?
- d) A mixture of calcium oxide and carbon dioxide is kinetically unstable with respect to calcium carbonate. What would happen if you passed carbon dioxide through a tube containing solid calcium oxide? If you think a reaction might occur, how much heat would be absorbed or evolved during that reaction?