**Q1.**

The enthalpy change for the reaction between hydrochloric acid and sodium hydroxide is −56 kJ mol−1. Therefore

   **A**    the reaction is exothermic and the temperature rises.

   **B**    the reaction is exothermic and the temperature falls.

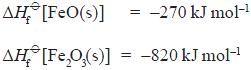
   **C**    the reaction is endothermic and the temperature rises.

   **D**    the reaction is endothermic and the temperature falls.

**(Total for Question = 1 mark)**

**Q2.**

Given the following data:



select the expression which gives the enthalpy change, in kJ mol−1, for the reaction:



   **A**     (−820 × ½) + 270 = −140

   **B**     (+820 × ½) − 270 = +140

   **C**     −820 + (270 × 2) = −280

   **D**     +820 − (270 × 2) = +280

**(Total for question = 1 mark)**

**Q3.**In an experiment performed to measure the enthalpy change for the reaction



3.0 g of zinc powder (an excess) was added to 30.0 cm3 of copper(II) sulfate solution  
 of concentration 1.00 mol dm−3. The temperature rise of the mixture was 47.6 K.  
 Assuming that the heat capacity of the solution is 4.2 J K−1 g−1, the enthalpy change for  
 the reaction is given by

   **A**      Δ*H* = −(30 x 4.2 x 47.6) ÷ 0.03

   **B**      Δ*H* = −(33 x 4.2 x 47.6) ÷ 0.03

   **C**      Δ*H* = −(30 x 4.2 x 47.6) x 0.03

   **D**      Δ*H* = −(33 x 4.2 x 47.6) x 0.03

**(Total for question = 1 mark)**

**Q6.**

When 10 cm3 of 2 mol dm−3 hydrochloric acid is reacted with 10 cm3 of 2 mol dm−3 sodium hydroxide solution, the temperature change is Δ*T*.



When the reaction is repeated with 50 cm3 of each solution, the temperature change is

   **A**     Δ*T*

   **B**     5 × Δ*T*

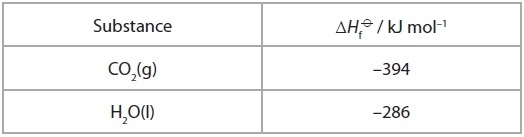
   **C**     1/5 × Δ*T*

   **D**     10 × 2 × Δ*T*

**(Total for question = 1 mark)**

**Q7.**The equation for the complete combustion of butanone, C2H5COCH3, is

C2H5COCH3(l) + 5½O2(g) → 4CO2(g) + 4H2O(l)         Δ*H* = −2440 kJ mol−1



From the above data, the standard enthalpy change of formation of butanone, in kJ mol−1, is

   **A**    −280

   **B**    +280

   **C**    −1760

   **D**    +1760

**(Total for Question = 1 mark)**

**Q9.**

For which of the following reactions is the enthalpy change equal to the bond enthalpy of H-I?

   **A**    

   **B**    

   **C**    

   **D**    

**(Total for Question = 1 mark)**

**Q10.**

The standard enthalpy changes of formation of carbon dioxide and of methanoic acid are −394 kJ mol−1 and −409 kJ mol−1 respectively. Calculate the enthalpy change for the reaction

H2(g) + CO2(g) → HCOOH(l)

   **A**    −803 kJ mol−1

   **B**    −15 kJ mol−1

   **C**    +803 kJ mol−1

   **D**    +15 kJ mol−1

**(Total for question = 1 mark)**

**Q12.**

Which equation represents the reaction for which the enthalpy change is the standard  
 enthalpy change of formation, Δ*H*f, of sodium nitrate, NaNO3?

   **A**      2Na(s) + N2(g) + 3O2(g) → 2NaNO3(s)

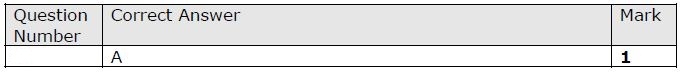
   **B**      Na(s) + ½N2(g) + 1½O2(g) → NaNO3(s)

   **C**      Na(s) + N(g) + 3O(g) → NaNO3(s)

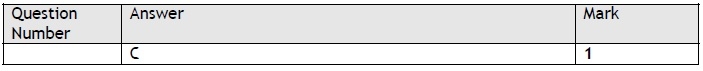
   **D**      Na(g) + ½N2(g) + 1½O2(g) → NaNO3(g)

**(Total for question = 1 mark)**

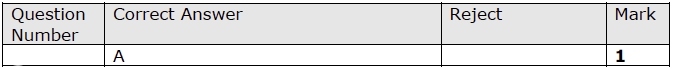
ANSWERS FOLLOW

**Q1.**

**Q2.**



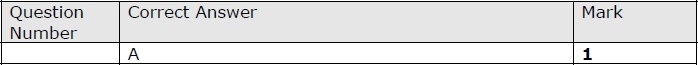
**Q3.**

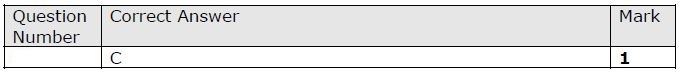


**Q6.**



**Q7.**



**Q9.**

**Q10.**



**Q12.**

