**Hess’s Law**

**2019**

**(a)** The equation for the formation of liquid hexane is:

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Calculate the standard enthalpy of formation for liquid hexane, Δf*H*°(C6H14*(l)*), using the following data:

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**(b)**

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**2018**

**(a) (i)**

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**(ii)** Explain how Δc*H*°(propan-1-ol) would differ if water was produced as a gas rather than a liquid.

(b)

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**2017**

Carbon dioxide and water are formed when decane burns completely in oxygen. The reaction is shown in

the equation below.

C10H22(l) + 15.5O2(*g*) → 10CO2(*g*) + 11H2O(l)

Calculate the enthalpy of combustion for decane, given the following data:

Δf*H*° (C10H22(*ℓ*)) = –301 kJ mol–1

Δc*H*° (C) = –393 kJ mol–1

Δc*H*° (H2) = –286 kJ mol–1

**2016**

The equation for the combustion of liquid methanol is:

CH3OH(l) + 1.5O2(*g*) → CO2(*g*) + 2H2O(l)

Calculate the standard enthalpy of combustion of liquid methanol, Δc*H*°(CH3OH(l)), using the information in the table below.



**2015**

The equation for the combustion of pentan-1-ol is:

C5H12O(l) + 7½ O2(*g*) → 5CO2(*g*) + 6H2O(l)

Calculate Δc*H* ° for pentan-1-ol, given the following data:

Δf *H* ° (C5H12O(l)) = −295 kJ mol–1

Δf *H* ° (CO2(*g*)) = −394 kJ mol–1

Δf *H* ° (H2O(l)) = −286 kJ mol–1

**2014**

An equation for the reaction of ammonia gas with hydrogen chloride gas is:

NH3(*g*) + HCl(*g*) → NH4Cl(*s*)

Calculate the standard enthalpy change, Δr*H°*, for this reaction, using the following data.

Δf *H°* (NH3(*g*)) = –46 kJ mol–1

Δf *H°* (HCl(*g*)) = –92 kJ mol–1

Δf *H°* (NH4Cl(*s*)) = –314 kJ mol–1

**2013**

Decane is a component of petrol. Carbon dioxide and water are formed when decane burns completely

in oxygen. C10H22(*ℓ*) + 15 ½ O2(*g*) → 10CO2(*g*) + 11H2O(*ℓ*)

Calculate Δc*H* ° (C10H22 (*ℓ*)), given the following data:

Δf *H* ° (C10H22(*ℓ*)) = –250 kJ mol–1

Δf *H* ° (CO2(*g*)) = –393 kJ mol–1

Δf *H* ° (H2O(*ℓ*)) = –286 kJ mol–1

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