Practice Question Set For A-Level
Subject : Chemistry
Paper-2 Topic: Physical

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Name of the Student:_____
Max. Marks : 19 Marks **Time : 19 Minutes**

Mark Schemes

Q1.

C

$Ba(s) + Cl_2(g) \rightarrow BaCl_2(s)$

[1]

Q2.

(a) Heat (energy) change at constant pressure

Ignore conditions even if wrong

Ignore energy change

1

(b) M2 $Ca^{2+}(g) + 2\ e^- + Cl_2(g)$

Alternative M2 $Ca^+(g) + e^- + 2\ Cl(g)$

1

M3 $Ca^{2+}(g) + 2\ Cl^-(g)$

1

M1 $Ca(s) + Cl_2(g)$

1

(c) M1 –795 + LE = 193 + 590 +1150 + (**2** x 121) + (**2** x –364)

Numbers and factors used correctly from cycle

1

M2 LE = (+) 2242 (kJ mol^{-1})

Rearrangement to calculate LE

If one or both factors of 2 missing award 1 mark for (+) 2485, (+)2121 or (+)2606 (kJ mol^{-1})

Allow 1 mark for – 2242 (kJ mol^{-1})

1

(d) $MgCl_2(s) \rightarrow Mg^{2+}(aq) + 2\ Cl^-(aq)$

Allow $MgCl_2(s) \rightleftharpoons Mg^{2+}(aq) + 2\ Cl^-(aq)$

Allow $MgCl_2(s) + aq \rightleftharpoons Mg^{2+}(aq) + 2\ Cl^-(aq)$

1

(e) M1 ΔH soln $MgCl_2$ = ΔH latt diss+ ΔH hyd Mg^{2+} + **2**ΔH hyd Cl^-
OR 2493 –1920 + (**2** x –364)

M1 for expression with or without numbers

1

M2 = – 155 (kJ mol^{-1})

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M2 for answer

If factor of 2 missing for ΔH hyd Cl^- allow 1 mark for 209

1

(f) M1 Ca^{2+} (ion) bigger/lower charge to size ratio (than Mg^{2+})

Allow converse answers

M1 Do not accept Ca^{2+} is a bigger atom/molecule

M1 Allow Ca^{2+} has more shells/ more distance of outer e to nucleus

Ignore more shielding

1

M2 weaker attraction/bond to ($O^{\delta-}$ in) water

1

[11]

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Q3.

(a)

	Temp/ ^{o}C		Mass /g
Initial		Burner before	
Final		Burner after	
(ΔT)		(Mass heptane burned)	

M1 for Temperature data including units
M2 for Burner mass data including units If either unit missing MAX 1

M1
M2

(b) Any two from:

Glass is a poorer conductor than copper

M1

Tripod and gauze would reduce heat transfer

Tripod and gauze would have a fixed height above the flame

Heat capacity of metal is less than glass or vice versa

M2

(c) Heat loss to surroundings or to copper/calorimeter

M1

Incomplete combustion

M2

(d) Use a wind shield (to reduce heat loss)

Allow use a lid
Insulate the sides of the calorimeter

1

[7]

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