Question	Marking Guidance	Mark	Comments
1(a)	Enthalpy change (to separate)1 mol of an (ionic) substance into its <u>ions</u>	1	If ionisation or hydration / solution, CE = 0 If atoms / molecules / elements mentioned, CE = 0 Allow heat energy change but not energy change alone. If forms 1 mol ions, lose M1
	Forms <u>ions</u> in the gaseous state	1	If lattice formation not dissociation, allow M2 only. Ignore conditions. Allow enthalpy change for $MX(s) \rightarrow M^+(g) + X^-(g)$ (or similar) for M1 and M2
1(b)	Any **one** of: • Ions are point charges • Ions are perfect spheres • Only electrostatic attraction / bonds (between ions) • No covalent interaction / character • Only ionic bonding / no polarisation of ions	1 max	If atoms / molecules mentioned, CE = 0
1(c)	(Ionic) radius / distance between ions / size	1	Allow in any order. Do not allow charge / mass or mass / charge.
	(Ionic) charge / charge density	1	Do not allow 'atomic radius'.

1(d)	$\Delta H_L = \Delta H_a$(chlorine) + ΔH_a(Ag) + I.E(Ag) +EA(Cl) - $\Delta H_f^{\ominus}$ = 121 + 289 + 732 -364 + 127 = (+) 905 (kJ mol^{-1})	1 1 1	Or cycle If $AgCl_2$, CE=0/3 Allow 1 for -905 Allow 1 for (+)844.5 (use of 121/2) Ignore units even if incorrect.
1(e)	**M1** Greater **M2** (Born-Haber cycle method allows for additional) covalent interaction ***OR*** **M1** Equal **M2** AgCl is perfectly ionic / no covalent character	1 1	Do not penalise $AgCl_2$ Allow AgCl has covalent character. Only score M2 if M1 is correct.