

AP WORKSHEET 06I: Born-Haber Cycles I

1. By constructing Born-Haber cycles or another method, use the data in the table below to calculate the enthalpy of formation of potassium bromide and magnesium chloride. (8)

All values in kJ mol ⁻¹	K	Mg	Br	Cl	KBr	MgCl ₂
ΔH_a	+90.00	+150.0	+112.0	+121.0		
$\Delta H_{i(1)}$	+418.0	+736.0				
$\Delta H_{i(2)}$	+3070.	+1450.				
ΔH_e			-342.0	-364.0		
ΔH_f					-670.0	-2493



2. Considering *only* the ionization energies of potassium, explain why K does not form KF_2 or KF_3 ? (2)

3. Write chemical equations to show the following processes. (14)
 - (a) The first ionization of strontium

 - (b) The second ionization energy of strontium

 - (c) The first electron affinity for fluorine

 - (d) The atomization of strontium

 - (e) The atomization of fluorine

 - (f) The enthalpy of formation of strontium fluoride

 - (g) The lattice enthalpy of strontium fluoride

4. Sometimes the calculated value and the theoretical value of lattice energies for a particular compound do not match well. Explain why. (2)

