Thermochemical principles and the properties of particles and substances survey

This shows what has come up over the last 7 years. It might not be 100% comprehensive as many questions cover multiple ideas but will be a good start.

Content ✓	2020	2019	2018	2017	2016	2015	2014
electron configuration (s, p, d notation); atoms and ions	✓	✓	✓	✓	✓	✓	✓
electron configuration; atoms and ions – irregular Cr and Cu	✓	✓	✓		✓	✓	✓
explaining why metal atoms > cations	✓						✓
explaining why nonmetal atoms < anions		✓					
Lewis diagram of molecule	✓		✓		✓	✓	
shape of molecule	✓		✓		✓	✓	
Lewis diagram of ion	✓				✓		✓
shape of ion	✓				✓		✓
shape and polarity of molecule: Lewis diagram provided	✓	✓	✓				
polarity of molecule: shape and formula provided				✓		✓	✓
predicting solubility in water based on shape/polarity of a molecule					✓		
define electronegativity				✓	✓	✓	
justification of difference in electronegativity for elements in same period		✓		✓			
justification of difference in electronegativity for elements in same group		✓			✓		
define first ionisation energy					✓	✓	
equation for first ionisation energy of a (named) element	✓			✓			✓
justification of difference in first ionisation energy for elements in same period	✓		✓			✓	
justification of difference in first ionisation energy for elements in same group	✓			✓	✓		
justification of difference in atomic radii of elements in same period			✓				
justification of difference in atomic radii of elements in same group							
relating trend in first ionisation energy to atomic radii (across a period)			✓				
comparing trend in first ionisation energy to electronegativity (down a group)					✓		
attractive forces between particles based on polarity or molar mass	✓	✓	✓	✓	✓	✓	✓

Content	2020	2019	2018	2017	2016	2015	2014
attractive forces between particles based on shape				✓		✓	
attractive forces – ionic compound included	✓				✓		
explaining solubility based on attractive forces solute-solvent				✓			
q = mcΔT calc; finding $\Delta_r H$	✓		✓		✓		
q = mcΔT calc; finding ΔT	✓						
explaining why experimental values of $\Delta_r H$ may be less negative	✓				✓		
interpreting heating curve; change of state	✓						✓
equation for standard enthalpy of vaporisation, $\Delta_{vap}H°$	✓						
equation for standard enthalpy of fusion, $\Delta_{fus}H°$			✓				
definition for standard enthalpy of fusion, $\Delta_{fus}H°$					✓		
equation for standard enthalpy of sublimation, $\Delta_{sub}H°$				✓			
explaining why $\Delta_{vap}H°$ is endothermic		✓					
explaining why $\Delta_{vap}H°$ is > $\Delta_{fus}H°$			✓		✓		
Definition/equation for standard enthalpy of formation, $\Delta_f H°$							
definition for standard enthalpy of combustion, $\Delta_c H°$						✓	
equation for standard enthalpy of combustion, $\Delta_c H°$						✓	
enthalpy calc: from $\Delta_f H°$ values provided; Can use Σproducts-Σreactants	✓	✓	✓			✓	✓
enthalpy calc: from given $\Delta_c H°$ / $\Delta_r H°$ values		✓	✓	✓	✓	✓	✓
explaining how $\Delta_r H°$ varies depending on state of product	✓		✓			✓	✓
discussion of spontaneity considering entropy changes of system and surroundings					✓		
discussion of spontaneity considering entropy changes of system and surroundings; $\Delta_r H$ = -ve	✓	✓		✓			
discussion of spontaneity considering entropy changes of system and surroundings; $\Delta_r H$ = +ve			✓				✓

Spare rows for any that have been missed.