

APOLLO

Energy cycles in reactions

HL

Chemistry

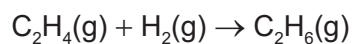
First assessment 2025

7 questions | questions

24. The table shows enthalpy of combustion data for several substances.

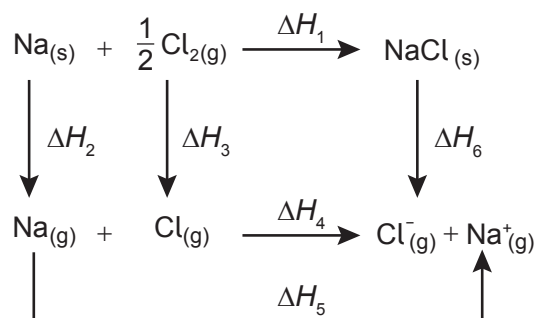
Substance	$\Delta H_c^\ominus$ (kJ mol ⁻¹)
C ₂ H ₆	-1561
C ₂ H ₄	-1411
H ₂	-286

Which expression would give the enthalpy for the following reaction?



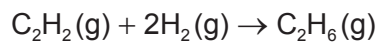
- A. $-1561 + 286 - 1411$
- B. $-1411 - 286 + 1561$
- C. $-1411 + 286 + 1561$
- D. $-1561 - 286 - 1411$

22. Which energy change on the diagram below represents the electron affinity of chlorine?



- A. ΔH_2
- B. ΔH_3
- C. ΔH_4
- D. ΔH_5

21. What is the enthalpy change for the reaction in kJ mol^{-1} ?



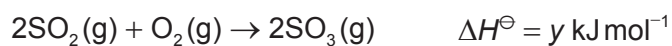
	$\Delta H_c^\theta / \text{kJ mol}^{-1}$
$\text{C}_2\text{H}_2(\text{g})$	-1301
$\text{H}_2(\text{g})$	-286
$\text{C}_2\text{H}_6(\text{g})$	-1561

- A. $-1561 - 2(-286) - 1301$
- B. $-1561 + 2(-286) - 1301$
- C. $-1301 + 2(-286) + 1561$
- D. $-1301 - 2(-286) + 1561$

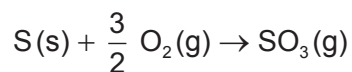
22. Which equation represents the enthalpy change of atomisation, ΔH_{at}^θ , of bromine?

- A. $\text{Br}_2(\text{l}) \rightarrow \text{Br}_2(\text{g})$
- B. $\frac{1}{2}\text{Br}_2(\text{g}) \rightarrow \text{Br}(\text{g})$
- C. $\frac{1}{2}\text{Br}_2(\text{l}) \rightarrow \text{Br}(\text{g})$
- D. $\text{Br}_2(\text{g}) \rightarrow 2\text{Br}(\text{g})$

20. Consider these equations:



What is the value of $\Delta H^\ominus$, in kJ mol^{-1} , for this reaction?

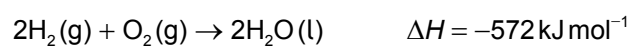
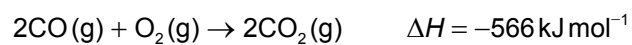
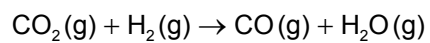


- A. $x + y$
- B. $x + \frac{1}{2} y$
- C. $x - \frac{1}{2} y$
- D. $x - y$

— 5 —

Turn over
0020-0219

21. What is the enthalpy change for the reaction in kJ mol^{-1} ?



- A. -1182
- B. -899
- C. -41
- D. +41

- 23.** Which are endothermic processes in a Born–Haber cycle for the formation of an ionic compound?
- I. Enthalpy of atomization
 - II. First electron affinity
 - III. First ionization energy
- A. I and II only
 - B. I and III only
 - C. II and III only
 - D. I, II and III