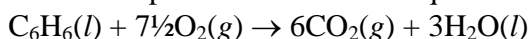


6. For each of the following pairs, predict which (A or B) will have the greater entropy, and in one sentence indicate your reasoning.

A	B
a. 1 mole of HI(g)	1 mole of HBr(g)
b. 1 mole of HI(g) at 20°C	1 mole of HI(g) at 30°C
c. 3 moles of H ₂ (g) + 1 mole of N ₂ (g)	2 moles of NH ₃ (g)
d. 1 mole of H ₂ (g), pressure = 1 atm	1 mole of H ₂ (g), pressure = 0.1 atm
e. 1 mole of CO ₂ (g)	1 mole of CO ₂ (aq)
f. 1 mole of HCOOH(l)	1 mole of HCOOH(aq)

7. The complete combustion of liquid benzene is represented by the equation:

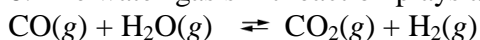


Using the data below, calculate, for this reaction

- ΔH°
- ΔS°
- ΔG° at 25°C.

Substance:	C ₆ H ₆ (l)	O ₂ (g)	CO ₂ (g)	H ₂ O(l)
ΔH°_f (kJ/mol):	49	0	-394	-286
S° (J/mol·K):	173	205	214	70

8. The water-gas shift reaction plays an important role in the production of clean fuel from coal.



Use the following thermodynamic data to determine the equilibrium constant K_p at 700. K.

Substance:	CO(g)	H ₂ O(g)	CO ₂ (g)	H ₂ (g)
ΔH°_f (kJ/mol):	-110.5	-241.8	-393.5	0
S° (J/mol·K):	197.7	188.8	213.7	130.7

9. A chemical reaction has $\Delta H^\circ = 42.8$ kJ and $\Delta S^\circ = 92.5$ J/K, at 25°C. Calculate the temperature at which $\Delta G^\circ = 0$. State any approximation involved in your calculation.

10. The formation constant for the reaction $\text{Ag}^+(aq) + 2\text{NH}_3(aq) \rightleftharpoons \text{Ag}(\text{NH}_3)_2^+(aq)$ is $K_f = 1.7 \times 10^7$ at 25°C. What is ΔG° at this temperature?

- A. -1.5 kJ B. -3.5 kJ C. -18 kJ D. -23 kJ E. -41 kJ