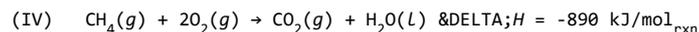
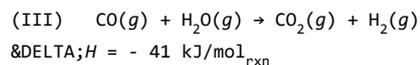
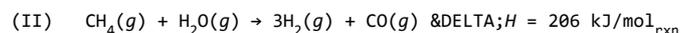
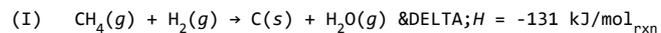


AP Chemistry Practice Test 8

Real AP Past Papers with Multiple-Choice Questions

Questions 1-5 refer to the following information.

The enthalpy values for several reactions are as follows:



1. In which of the reactions does the amount of energy released by the formation of bonds in the products exceed the amount of energy necessary to break the bonds of the reactants by the greatest amount?

- A. Reaction I
- B. Reaction II
- C. Reaction III
- D. Reaction IV

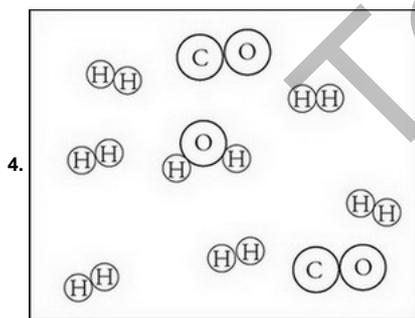
2. In which of the reactions is the value for ΔS the most positive?

- A. Reaction I
- B. Reaction II
- C. Reaction III
- D. Reaction IV

3. Regarding reaction I, how would the addition of a catalyst affect the enthalpy and entropy changes for this reaction?

Enthalpy Entropy

- A. Decrease Decrease
- B. Decrease No Change
- C. No Change Decrease
- D. No Change No Change



Regarding reaction II, to achieve the products present in the above diagram how many moles of each reactant must be present prior to the reaction?

- A. 1.0 mol of CH_4 and 2.0 mol of H_2O

- B. 2.0 mol of CH₄ and 2.0 mol of H₂O
- C. 2.0 mol of CH₄ and 3.0 mol of H₂O
- D. 3.0 mol of CH₄ and 2.0 mol of H₂O

5. Regarding reaction IV, how much heat is absorbed or released when 2.0 mol of CH₄(g) reacts with 2.0 mol of O₂(g) ?

- A. 890 kJ of heat is released.
- B. 890 kJ of heat is absorbed.
- C. 1780 kJ of heat is released.
- D. 1780 kJ of heat is absorbed.

6. London dispersion forces are caused by

- A. temporary dipoles created by the position of electrons around the nuclei in a molecule
- B. the three-dimensional intermolecular bonding present in all covalent substances
- C. the uneven electron-to-proton ratio found on individual atoms of a molecule
- D. the electronegativity differences between the different atoms in a molecule

7. What is the general relationship between temperature and entropy for diatomic gases?

- A. They are completely independent of each other; temperature has no effect on entropy.
- B. There is a direct relationship, because at higher temperatures there is an increase in energy dispersal.
- C. There is an inverse relationship, because at higher temperatures substances are more likely to be in a gaseous state.
- D. It depends on the specific gas and the strength of the intermolecular forces between individual molecules.

8. Which of the following pairs of ions would make the best buffer with a basic pH?

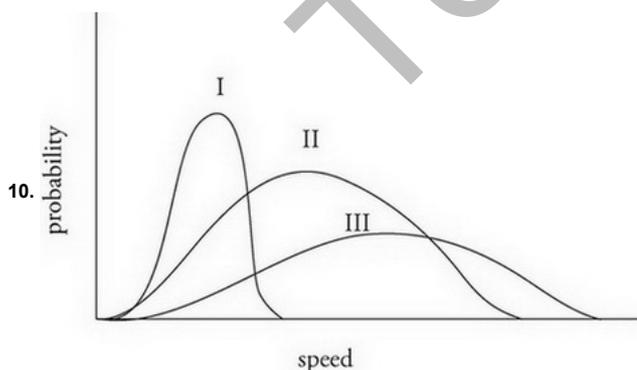
$$K_a \text{ for HC}_3\text{H}_2\text{O}_2 = 1.75 \times 10^{-5}$$

$$K_a \text{ for HPO}_4^{2-} = 4.8 \times 10^{-13}$$

- A. H₂SO₄ and H₂PO₄
- B. HPO₄²⁻ and NaH₂PO₄⁻
- C. HC₃H₂O₂ and NaC₃H₂O₂
- D. NaOH and HC₂H₃O₂

9. A solution contains a mixture of four different compounds: KCl(aq), Fe(NO₃)₃(aq), MgSO₄(aq), and N₂H₄(aq). Which of these compounds would be easiest to separate via distillation?

- A. KCl(aq)
- B. Fe(NO₃)₃(aq)
- C. MgSO₄(aq)
- D. N₂H₄(aq)



Identify the three gases represented on the Maxwell-Boltzmann diagram above. Assume all gases are at the same temperature.

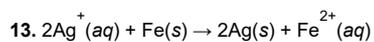
- I II III
- A. H₂ N₂ F₂
 - B. H₂ F₂ N₂
 - C. F₂ N₂ H₂
 - D. N₂ F₂ H₂

11. A sample of solid MgCl₂ would be most soluble in which of the following solutions?

- A. $\text{LiOH}(aq)$
- B. $\text{CBr}_4(aq)$
- C. $\text{Mg}(\text{NO}_3)_2(aq)$
- D. $\text{AlCl}_3(aq)$

12. Most transition metals share a common oxidation state of +2. Which of the following best explains why?

- A. Transition metals all have a minimum of two unpaired electrons.
- B. Transition metals have unstable configurations and are very reactive.
- C. Transition metals tend to gain electrons when reacting with other elements.
- D. Transition metals will lose their outermost s-block electrons when forming bonds.



Which of the following would cause an increase in potential in the voltaic cell described by the above reaction?

- A. Increasing $[\text{Fe}^{2+}]$
- B. Adding more $\text{Fe}(s)$
- C. Decreasing $[\text{Fe}^{2+}]$
- D. Removing some $\text{Fe}(s)$

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