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Courses » Fundamentals Of Combustion (Part 1)

Announcements   **Course**   Ask a Question   Progress   Mentor

Unit 6 - Week 5 : Chemical Kinetics

Week 5 Assessment 5

The due date for submitting this assignment has passed. **Due on 2018-03-14, 23:59 IST.**

Submitted assignment

1) Determine the mean speed (m/s) for CO molecules at 400^0C.   *1 point*

○ 713.3
○ 632.2
○ 831.3
○ 532.2

No, the answer is incorrect.
Score: 0

Accepted Answers:
713.3

2) Determine the most probable speed (m/s) for CO molecules at 400^0C   *1 point*

○ 731.3
○ 632.2
○ 831.3
○ 532.2

No, the answer is incorrect.
Score: 0

Accepted Answers:
632.2

3) Which of the following statements are true for catalyzed reactions?   *1 point*

○ Catalyzed reactions lower the activation energy.
○ Catalyzed reactions do not take part in reactions
○ Catalyzed reaction take part in reaction process
○ Both (a) and (b)

No, the answer is incorrect.
Score: 0

Accepted Answers:
Both (a) and (b)

4) Determine activation energy (kJ/mol) for the chemical reaction for the experimental conditions   *3 points*
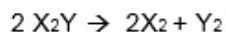
$$2 X_2Y \rightarrow 2X_2 + Y_2$$

T(K)	k (Rate constant) m^3/mol s
300	0.25×10^{-6}
700	0.85×10^{-2}

○ 35.5

○ 25.5

○ 45.5

○ 55.5

No, the answer is incorrect.
Score: 0

Accepted Answers:
45.5

5) The rate constant of the reaction increases by,   *1 point*

○ increasing the temperature

○ increasing the concentration of reactants

○ using a catalyst

○ None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
increasing the concentration of reactants

6) Law of mass action holds good for   *1 point*

○ First order reactions

○ Second order reactions

○ Elementary reactions

○ Global reactions

No, the answer is incorrect.
Score: 0

Accepted Answers:
Elementary reactions

7) According to the collision theory, the chemical reaction occurs successfully only when it *1 point*

○ collides with a proper orientation determined by steric factor

○ possess energy greater than the threshold energy

○ reactant molecules must be very reactive

○ Both (a) and (b)

No, the answer is incorrect.
Score: 0

Accepted Answers:
Both (a) and (b)

8) In a first-order reaction, the rate of reactant species   *1 point*

○ remains constant with time

○ decreases with time

○ decreases exponentially with time

○ None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
decreases exponentially with time

9) In a reaction, $2H_2O \rightarrow 2H_{2(l)} + O_{2(g)}$ the average rate of disappearance of H_2O over **2 points** the time period from t = 0 to t = 500 min is found to be

4×10^{-5} mole/min. What is the rate of appearance of O_2 over the same time period in mol/min?

- ○ 6×10^{-5}
- ○ 4×10^{-5}
- ○ 8×10^{-5}
- ○ 2×10^{-5}

No, the answer is incorrect.
Score: 0

Accepted Answers:
2×10^{-5}

10) The decomposition of $2H_2O \rightarrow 2H_2(l) + O_2(g)$ is first order in H_2O. It was found that an **2 points** initial concentration of 0.25 dropped to 0.05 in 230 s during the experiment. What is the value of the rate constant?

- ○ $6.0 \times 10^{-3} s^{-1}$
- ○ $4.5 \times 10^{-3} s^{-1}$
- ○ $5.5 \times 10^{-3} s^{-1}$
- ○ $7.0 \times 10^{-3} s^{-1}$

No, the answer is incorrect.
Score: 0

Accepted Answers:
$7.0 \times 10^{-3} s^{-1}$

11) Which of the following is wrongly stated regarding activation energy,   **1 point**

- ○ Activation energy can be negative.
- ○ Activation energy is the energy above the threshold level for a reaction.
- ○ Activation energy can be determined from Arrhenius plots.
- ○ Catalysts lower the activation energy for reactions.

No, the answer is incorrect.
Score: 0

Accepted Answers:
Activation energy can be negative.

12) Which of the following is wrongly stated for Arrhenius equation   **1 point**

- ○ When activation energy increases, the reaction rate becomes faster
- ○ With increase in temperature, reaction rate becomes faster.
- ○ Smaller the fraction of activation energy to temperature faster the reaction rate
- ○ Predict the rate of reaction at a different temperature if activation energy and the reaction rate at another temperature is known.

No, the answer is incorrect.
Score: 0

Accepted Answers:
When activation energy increases, the reaction rate becomes faster

13) Which of the following are the properties of compact notation,   **1 point**

- ○ Sparse coefficient matrix when involving a large number of species.
- ○ This has been developed to represent both the mechanism and the individual species production rates.
- ○ It is particularly useful to solve chemical kinetics using computer
- ○ All of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:

All of the above

14) Hydrogen Iodide with an initial concentration of 70 mol/m^3 is decomposed to H_2 and I_2 **3 points** molecules as per the following reaction 2HI àH$_2$+I$_2$. It is found that 20% of the initial hydrogen iodide is decomposed in 45s. The half-life of the reaction is,

○ 180.1

○ 210.1

○ 310.2

○ 440.1

No, the answer is incorrect.
Score: 0

Accepted Answers:
180.1

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