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°C.
   - 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°C
   - 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?
   - 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

https://onlinecourses.nptel.ac.in/noc18_ae01/unit?unit=32&assessment=89
$2 \text{X}_2\text{Y} \rightarrow 2\text{X}_2 + \text{Y}_2$

<table>
<thead>
<tr>
<th>$T$(K)</th>
<th>$k$ (Rate constant) $\text{m}^3\text{mol}^{-2}\text{mol}^{-1}\text{s}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>300</td>
<td>$0.25 \times 10^{-5}$</td>
</tr>
<tr>
<td>700</td>
<td>$0.85 \times 10^{-2}$</td>
</tr>
</tbody>
</table>

5) The rate constant of the reaction increases by,
   - increasing the temperature
   - increasing the concentration of reactants
   - using a catalyst
   - None of the above

   **No, the answer is incorrect.**
   **Score:** 0
   **Accepted Answers:**
   45.5

6) Law of mass action holds good for
   - 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
   - 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
   - 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, \(2\text{H}_2\text{O} \rightarrow \text{2H}_2\text{(g)} + \text{O}_2\text{(g)}\) the average rate of disappearance of \(\text{H}_2\text{O}\) over the time period from \(t = 0\) to \(t = 500\) min is found to be \(4 \times 10^{-5}\) mole/min. What is the rate of appearance of \(\text{O}_2\) over the same time period in mol/min?

- \(6 \times 10^{-5}\)
- \(4 \times 10^{-5}\)
- \(8 \times 10^{-5}\)
- \(2 \times 10^{-5}\)

No, the answer is incorrect.
Score: 0
Accepted Answers:
\(2 \times 10^{-5}\)

10) The decomposition of \(2\text{H}_2\text{O} \rightarrow 2\text{H}_2\text{(l)} + \text{O}_2\text{(g)}\) is first order in \(\text{H}_2\text{O}\). It was found that an initial concentration of 0.25 dropped to 0.05 in 230 s during the experiment. What is the value of the rate constant?

- \(6.0 \times 10^{-3}\text{ s}^{-1}\)
- \(4.5 \times 10^{-3}\text{ s}^{-1}\)
- \(5.5 \times 10^{-3}\text{ s}^{-1}\)
- \(7.0 \times 10^{-3}\text{ s}^{-1}\)

No, the answer is incorrect.
Score: 0
Accepted Answers:
\(7.0 \times 10^{-3}\text{ s}^{-1}\)

11) Which of the following is wrongly stated regarding activation energy?

- 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

- 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,

- 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/m³ is decomposed to H₂ and I₂ molecules as per the following reaction 2HI → H₂ + I₂. 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