If the temperature of a reaction is increased,

1. rate constants always increase and equilibrium constants always decrease.
2. rate constants always increase and equilibrium constants always increase.
3. rate constants always decrease and equilibrium constants always decrease.
4. rate constants always decrease and equilibrium constants always increase.
5. rate constants always decrease and equilibrium constants either increase or decrease.
6. rate constants always increase and equilibrium constants either increase or decrease.

If the temperature of a reaction is increased,

14% 1. rate constants always increase and equilibrium constants always decrease.

16% 2. rate constants always increase and equilibrium constants always increase.

8% 3. rate constants always decrease and equilibrium constants always decrease.

1% 4. rate constants always decrease and equilibrium constants always increase.

4% 5. rate constants always decrease and equilibrium constants either increase or decrease.

56% ✓ 6. rate constants always increase and equilibrium constants either increase or decrease.

Free energy, ΔG, is a state function, independent of path. Therefore the equilibrium constant ________________________ by the presence of a catalyst.

1. becomes more negative (more spontaneous)
2. becomes more negative (less spontaneous)
3. becomes more positive (more spontaneous)
4. becomes more positive (less spontaneous)
5. is not changed

Free energy, ΔG, is a state function, independent of path. Therefore the equilibrium constant ________________________ by the presence of a catalyst.

10% 1. becomes more negative (more spontaneous)

4% 2. becomes more negative (less spontaneous)

8% 3. becomes more positive (more spontaneous)

0% 4. becomes more positive (less spontaneous)

78% 5. is not changed

Which rate laws are correct for step 1?

Step 1 $$E + S \underset{k_{-1}}{\overset{k_1}{\Leftrightarrow}} ES$$

1. $Rate_f = k_1 [E][S]$ and $Rate_r = k_{-1}[ES]$
2. $Rate_f = k_1 [ES]$ and $Rate_r = k_{-1}[E][S]$
3. $Rate_f = k_1 [ES]/[E][S]$ and $Rate_r = k_{-1}[E][S]/[ES]$
4. $Rate_f = k_1 [ES]/[E]$ and $Rate_r = k_{-1}[E]/[ES]$

Which rate laws are correct for step 1?

Step 1 $E + S \underset{k_{-1}}{\overset{k_1}{\Leftrightarrow}} ES$

74%	1. $Rate_f = k_1 [E][S]$ and $Rate_r = k_{-1}[ES]$
8%	2. $Rate_f = k_1 [ES]$ and $Rate_r = k_{-1}[E][S]$
16%	3. $Rate_f = k_1 [ES]/[E][S]$ and $Rate_r = k_{-1}[E][S]/[ES]$
3%	4. $Rate_f = k_1 [ES]/[E]$ and $Rate_r = k_{-1}[E]/[ES]$

Solve for intermediate [ES]
$d[ES]/dt =$

1. $k_1[E][S] / k_2[ES]$
2. $k_1[E][S] - k_2[ES]$
3. $k_1[E][S] - k_{-1}[ES] - k_2[ES]$
4. $k_1[E][S] / k_{-1}[ES]k_2[ES]$

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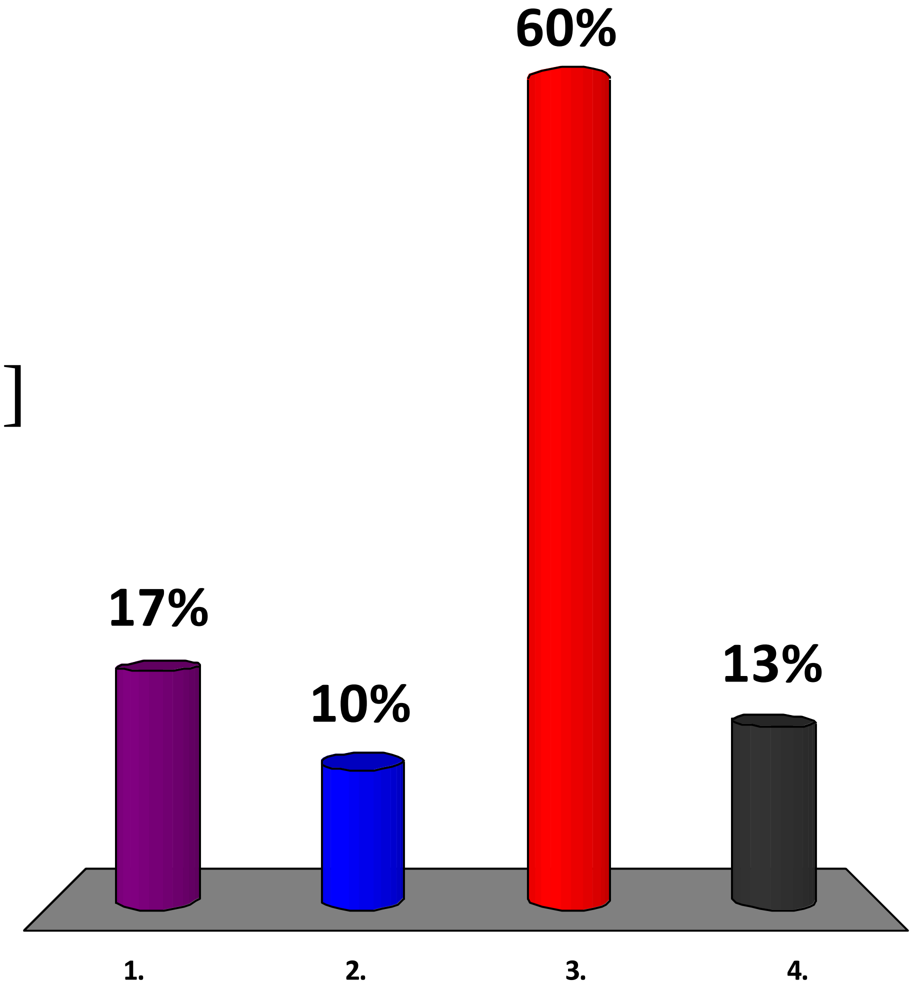

The conversion of CO_2 in blood to HCO^- and H_3O^+ is catalyzed by the enzyme carbonic anhydrase. The Michaelis-Menton constants for this enzyme and substrate are $K_m = 8 \times 10^{-5}$ M and $k_2 = 6 \times 10^5 \text{ s}^{-1}$.

What is the maximum reaction rate if the enzyme concentration is 5×10^{-6} M?

1. $(5 \times 10^{-6} \text{ M}) \times (6 \times 10^5 \text{ s}^{-1}) = 3$ M/s
2. $(6 \times 10^5 \text{ s}^{-1}) / (5 \times 10^{-6} \text{ M}) = \underline{1}.2 \times 10^{11} \text{ M}^{-1} \text{ s}^{-1}$
3. 8×10^{-5} M/s
4. $6 \times 10^5 \text{ s}^{-1}$

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What is the maximum reaction rate if the enzyme concentration is 5×10^{-6} M?

75%	✓ 1.	$(5 \times 10^{-6}\ M) \times (6 \times 10^5\ s^{-1}) = 3\ M/s$
15%	2.	$(6 \times 10^5\ s^{-1}) / (5 \times 10^{-6}\ M) = \underline{1}.2 \times 10^{11}\ M^{-1}\ s^{-1}$
4%	3.	8×10^{-5} M/s
6%	4.	$6 \times 10^5\ s^{-1}$

The conversion of CO_2 in blood to HCO^- and H_3O^+ is catalyzed by the enzyme carbonic anhydrase. The Michaelis-Menton constants for this enzyme and substrate are $K_m = 8 \times 10^{-5}$ M and $k_2 = 6 \times 10^5\ s^{-1}$. The enzyme concentration is 5×10^{-5} M.

At which concentration of substrate will the rate be 1.5 M/s?

1. not enough information given.
2. 5×10^{-6} M
3. 2.5×10^{-6} M
4. 8×10^{-5} M
5. 4×10^{-5} M

The conversion of CO_2 in blood to HCO^- and H_3O^+ is catalyzed by the enzyme carbonic anhydrase. The Michaelis-Menton constants for this enzyme and substrate are $K_m = 8 \times 10^{-5}$ M and $k_2 = 6 \times 10^{5}\ s^{-1}$. The enzyme concentration is 5×10^{-5} M.

At which concentration of substrate will the rate be 1.5 M/s?

9%	1.	not enough information given.
13%	2.	5×10^{-6} M
31%	3.	2.5×10^{-6} M
40% ✓	4.	8×10^{-5} M
7%	5.	4×10^{-5} M