



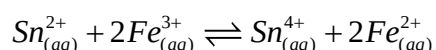
HOW WELL DO YOU KNOW YOUR COURSE MATERIALS?

These questions (and many others) will be addressed in detail in the TSFX "Unit 3 & 4 – VCE Exam Revision Lectures" in September 2019.

UNIT 3 & 4 CHEMSITRY

QUESTION 1

A drop of concentrated Fe^{3+} is added to the following equilibrium mixture and constant temperature:

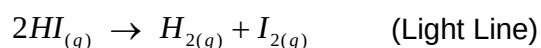
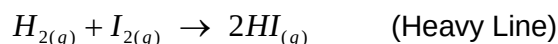


Which of the following statements is correct?

- A While equilibrium is being re-established, the rate of the forward reaction increases.
- B While equilibrium is being re-established, the rate of the forward reaction decreases.
- C The equilibrium constant at the end of the reaction will be different from that at the beginning of the reaction.
- D The total number of ions decreases.

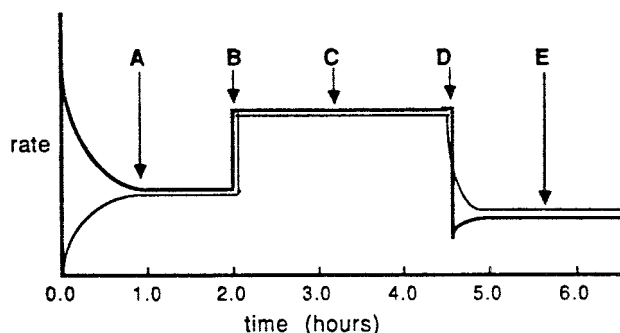
QUESTION 2

The graph below shows the variation in the reaction rates for the following reactions:



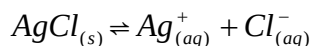
Which of the following changes was introduced at the 4.5 hour mark?

- A A catalyst was added.
- B The temperature was increased.
- C The temperature was decreased.
- D HI was removed.



QUESTION 3

The equilibrium constant for the reaction below at 25°C is $1.7 \times 10^{-10} \text{ M}^{-2}$.



Which of the following answers represents the equilibrium constant at 50°C ?

- A $2 \times 1.7 \times 10^{-10} \text{ M}^{-2}$
- B $\frac{1}{2} \times 1.7 \times 10^{-10} \text{ M}^{-2}$
- C $(1.7 \times 10^{-10})^2 \text{ M}^{-2}$
- D K cannot be determined from the information provided

QUESTION 4

The standard half cell potentials of some metal ion/metal systems are given below.

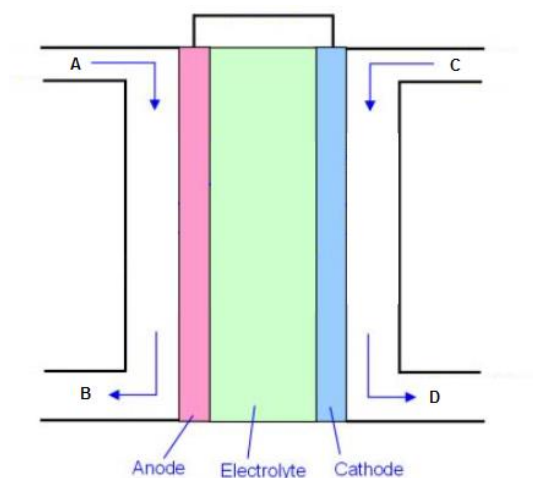
Species	E° (Volts)
$\text{Au}_{(aq)}^{3+} / \text{Au}_{(s)}$	+ 1.29
$\text{Ba}_{(aq)}^{2+} / \text{Ba}_{(s)}$	– 2.90
$\text{Cu}_{(aq)}^{2+} / \text{Cu}_{(s)}$	+ 0.34
$\text{Fe}_{(aq)}^{2+} / \text{Fe}_{(s)}$	– 0.44

Which species in this list would spontaneously react with copper ions to form copper metal?

- A $\text{Fe}_{(s)}$
- B $\text{Au}_{(s)}$
- C $\text{Fe}_{(s)}$ and $\text{Ba}_{(s)}$
- D $\text{Au}_{(s)}$ and $\text{Ba}_{(s)}$

QUESTION 5

The diagram below shows the structure of a molten carbonate fuel cell.



The mole of electrons consumed at the cathode would be:

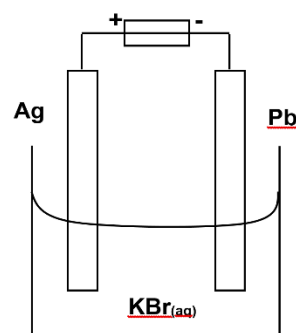
- A 4 mol
- B Double the mole produced at the anode.
- C Half the mole produced at the anode.
- D The same as the mole produced at the anode.

QUESTION 6

Consider the following electrolytic cell.

The reaction that occurs at the anode is

- A $Pb_{(s)} \rightarrow Pb_{(aq)}^{2+} + 2e^{-}$
- B $Ag_{(s)} \rightarrow Ag_{(aq)}^{+} + e^{-}$
- C $2H_2O_{(l)} \rightarrow O_{2(g)} + 4H_{(aq)}^{+} + 4e^{-}$
- D $2H_2O_{(l)} + 2e^{-} \rightarrow H_{2(g)} + 2OH_{(aq)}^{-}$



QUESTION 7

Several metals are produced by the electrolysis of molten salts. In one such case a current of 30,000 A produced 22.4 kg of metal per hour. Given that the cation of the metal has a valency of + 2 , the metal being produced is

- A Calcium
- B Bromine
- C Magnesium
- D Sodium

QUESTION 8

Which of the following bonds are not produced between fluoromethane and water molecules?

- A Dispersion forces
- B Dipole-dipole forces
- C Ion-dipole bonding
- D Hydrogen bonding

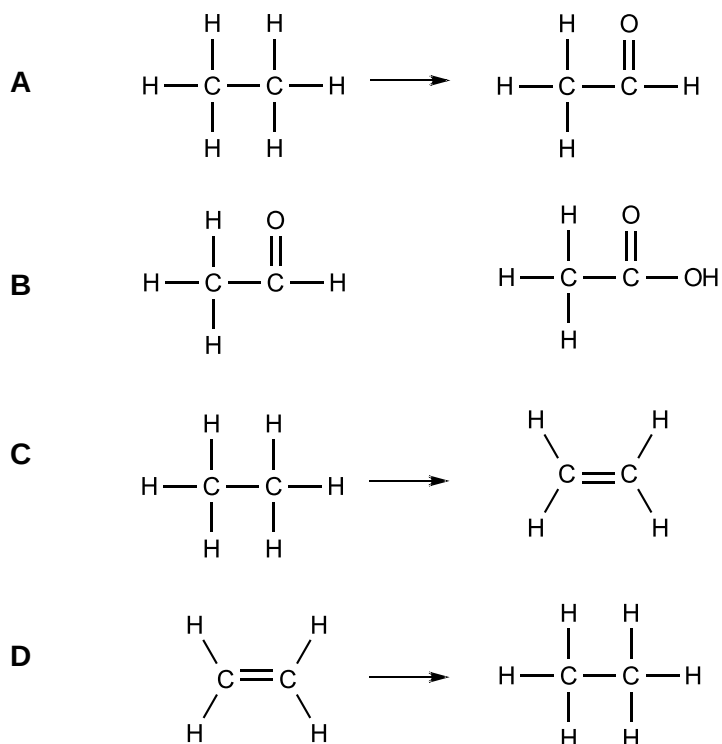
QUESTION 9

Which solvent could not be used to dissolve most esters?

- A Benzene
- B Water
- C Carbon tetrachloride (CCl_4)
- D Ethanol

QUESTION 10

Which of the following processes represents reduction?



QUESTION 11

A compound introduced into a mass spectrometer gave a spectrum corresponding to fragments including CCl_3^+ , CCl_2F^+ , CCl_2^+ , CCl^+ and CF^+ . Which of the following is the most likely formula for the compound?

- A CCl_3F
- B CCl_2F_2
- C $CClF_3$
- D $CHClF_2$

QUESTION 12

Which molecule would display the larger retention time in normal phase column chromatography?

- A 1-iodo-2,3-dimethylbutane
- B 1-iodo-2,3-dimethylhexane
- C 2,3-dimethylbutane
- D 2,3-dimethylhexane

QUESTION 13

Oxalic acid ($HOOC-COOH$) and ethanoic acid (CH_3COOH) are both weak acids. Nitric acid (HNO_3) is a strong acid. 20.00 mL solutions of 0.10 M concentration of each of these three acids were separately titrated with a 0.10 M solution of sodium hydroxide ($NaOH$). In order to react completely:

- A All three acids would require the same amount of $NaOH$.
- B HNO_3 would require more $NaOH$ than CH_3COOH but less than $HOOC-COOH$.
- C $HOOC-COOH$ and CH_3COOH would require the same amount of $NaOH$ but HNO_3 would require more.
- D CH_3COOH and HNO_3 would require the same amount of $NaOH$ but $HOOC-COOH$ would require more.

QUESTION 14

Which of the following statements regarding monosaccharides is incorrect?

- A The functional group in monosaccharides is the hydroxy group
- B Monosaccharides behave as weak reductants
- C Monosaccharides cannot be hydrolysed to produce smaller units
- D Monosaccharides can be oxidised to produce smaller units

QUESTION 15

Which of the following could represent the products of the hydrolysis of a polyunsaturated fat?

- A $\text{C}_3\text{H}_8\text{O}_3$ and $\text{C}_{15}\text{H}_{31}\text{COOH}$
- B $\text{C}_6\text{H}_{12}\text{O}_6$ and $\text{C}_{15}\text{H}_{27}\text{COOH}$
- C $\text{C}_3\text{H}_8\text{O}_3$ and $\text{C}_{15}\text{H}_{27}\text{COOH}$
- D CO_2 and H_2O

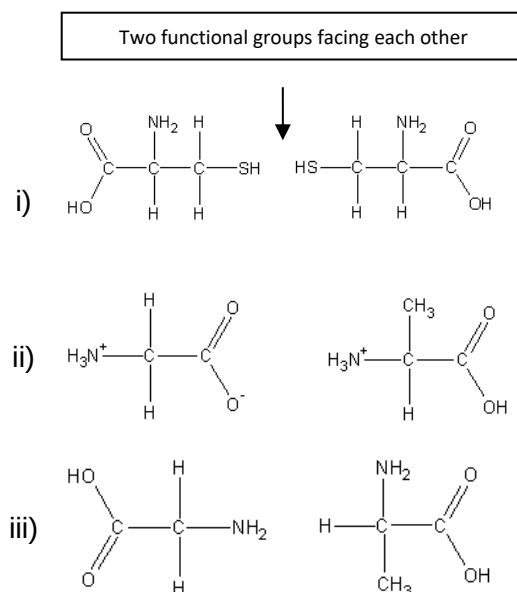
QUESTION 16

A certain amino acid contained 40.4% carbon, 7.9% hydrogen and 15.7% nitrogen. If the balance of the molecule is oxygen, the amino acid is most likely to be

- A Alanine
- B Cysteine
- C Glycine
- D Valine

QUESTION 17

The amino acids below are orientated so that two functional groups are facing each other. Which of these amino acid pairs are oriented so that if they were part of a protein the functional groups would maintain the tertiary structure of the protein?



- A i only
- B i & ii
- C i, ii & iii
- D i & iii

These questions (and many others) will be addressed in detail in the TSFX “Unit 3 & 4 – VCE Exam Revision Lectures” in September 2019.

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Dates: Saturday 21 September – Saturday 5 October 2019

Venue: The University of Melbourne



ANSWERS

QUESTION 1	Answer is B
QUESTION 2	Answer is C
QUESTION 3	Answer is D
QUESTION 4	Answer is C
QUESTION 5	Answer is D
QUESTION 6	Answer is B
QUESTION 7	Answer is A
QUESTION 8	Answer is C
QUESTION 9	Answer is B
QUESTION 10	Answer is D
QUESTION 11	Answer is A
QUESTION 12	Answer is B
QUESTION 13	Answer is D
QUESTION 14	Answer is B
QUESTION 15	Answer is C
QUESTION 16	Answer is A
QUESTION 17	Answer is A