

Name: \_\_\_\_\_

Date: \_\_\_\_\_



**Question: 1 of 19**

QID: 364

Marks: 1

What is the correct name for the compound  $\text{CH}_3\text{CH}_2\text{CH}(\text{CH}_3)\text{CH}(\text{OH})\text{CH}_3$ ?

Please mark (✓) for the correct answer.

- A. 2-ethylbutan-3-ol                       B. 3-ethylbutan-2-ol  
 C. 2-methylpentan-3-ol                       D. 3-methylpentan-2-ol

**Question: 2 of 19**

QID: 365

Marks: 1

Which is unsaturated, aliphatic and has alkyl chains?

Please mark (✓) for the correct answer.

- A. cyclohexane                                       B. 2-methylpropene  
 C. 2,3-dimethyloctane                               D. 1,3-dimethylbenzene

**Question: 3 of 19**

QID: 366

Marks: 1

Which pair are within the same homologous series?

Please mark (✓) for the correct answer.

- A. butane and methylpropane                       B. ethane and ethanol  
 C. heptane and octane                                       D. prop-1-enol and prop-2-en-1-ol

**Question: 4 of 19**

QID: 367

Marks: 1

Which mechanism involves heterolytic fission?

Please mark (✓) for the correct answer.

- A.  $\text{C}_2\text{H}_4 + \text{HBr} \rightarrow \text{C}_2\text{H}_5\text{Br}$                        B.  $\text{C}_2\text{H}_6 + \text{Br}_2 \rightarrow \text{C}_2\text{H}_5\text{Br} + \text{HBr}$   
 C.  $\text{O}_3 + \text{O}\cdot \rightarrow 2\text{O}_2$                                        D. none of the above

**Question: 5 of 19**

QID: 368

Marks: 1

Which substance would have the highest boiling point?

Please mark (✓) for the correct answer.

- A. 2,2-dimethylpropane
- B. 2,3-dimethylpentane
- C. heptane
- D. 2-methylheptane

**Question: 6 of 19**

QID: 369

Marks: 1

What is the bond angle across the C=C–Cl bond in 1-chloroprop-1-ene?

Please mark (✓) for the correct answer.

- A. 104.5°
- B. 107°
- C. 109.5°
- D. 120°

**Question: 7 of 19**

QID: 370

Marks: 1

Which will not show E/Z isomerism?

Please mark (✓) for the correct answer.

- A. 1,2-dichloroethene
- B. 2-methylpropene
- C. but-2-ene
- D. hex-1,3-diene

**Question: 8 of 19**

QID: 371

Marks: 1

Which is the most common product of the reaction between HBr and 3-methylpent-2-ene?

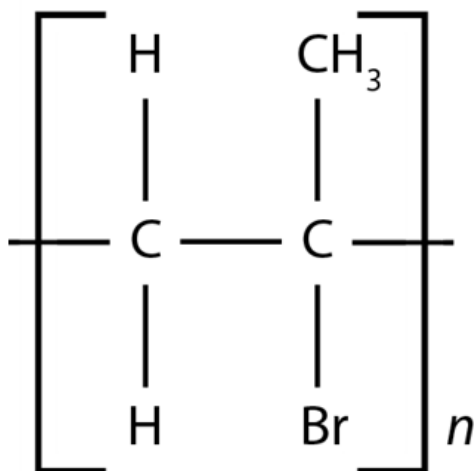
Please mark (✓) for the correct answer.

- A. 2,3-dibromo-3-methylpentane
- B. 2-bromo-3-methylpentane
- C. 2,4-dibromo-3-methylpentane
- D. 3-bromo-3-methylpentane

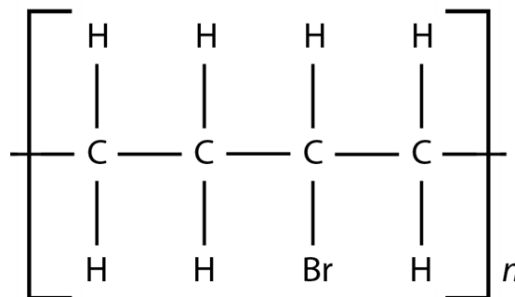
Which picture shows the polymer formed from 2-bromobut-2-ene?

Please mark (✓) for the correct answer.

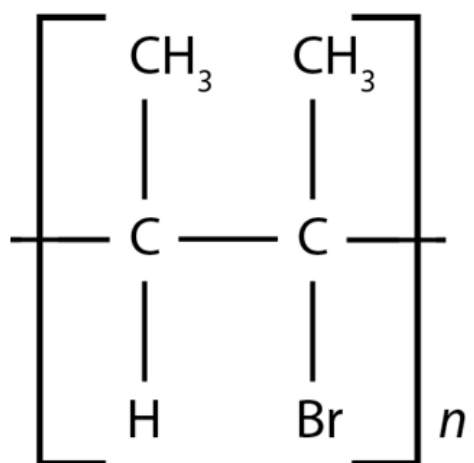
A.



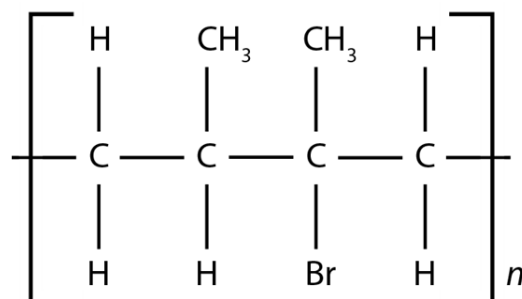
B.



C.



D.



## Question: 10 of 19

Which of the following statement(s) is/are true?

- 1) Photodegradable polymers form CO<sub>2</sub> and H<sub>2</sub>O when they break down.
- 2) Plastics can be formed from renewable and non-renewable sources.
- 3) Halogenated polymers can produce toxic chemicals when burned.

Please mark (✓) for the correct answer.

A. 1, 2 and 3

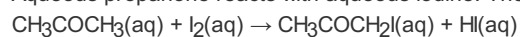
B. only 1 and 2

C. only 2 and 3

D. only 1

Propanone,  $\text{CH}_3\text{COCH}_3$ , is an organic liquid which is soluble in water.

Aqueous propanone reacts with aqueous iodine. The reaction is catalysed by  $\text{H}^+(\text{aq})$  ions.



The order of reaction with respect to iodine can be determined experimentally.

An experiment is carried out using the following solutions.

- Solution A,  $25.0 \text{ cm}^3$  of  $1.00 \text{ mol dm}^{-3}$   $\text{CH}_3\text{COCH}_3(\text{aq})$
- Solution B,  $25.0 \text{ cm}^3$  of  $1.00 \text{ mol dm}^{-3}$   $\text{H}_2\text{SO}_4(\text{aq})$
- Solution C,  $50.0 \text{ cm}^3$  of  $0.200 \text{ mol dm}^{-3}$   $\text{I}_2(\text{aq})$

The solutions are mixed to start the reaction. At certain time intervals, a  $10.0 \text{ cm}^3$  portion of the mixture is withdrawn and transferred to a conical flask containing excess sodium hydrogencarbonate,  $\text{NaHCO}_3(\text{aq})$ . This prevents any further significant reaction taking place by removing the  $\text{H}^+(\text{aq})$  ions. The concentration of unreacted  $\text{I}_2(\text{aq})$  in each  $10.0 \text{ cm}^3$  portion of the mixture can then be determined by titration with aqueous thiosulfate ions,  $\text{S}_2\text{O}_3^{2-}(\text{aq})$ .

(a) State the size and type of apparatus needed to prepare a suitable volume of a standard solution of  $1.00 \text{ mol dm}^{-3}$   $\text{CH}_3\text{COCH}_3(\text{aq})$  from liquid propanone. After, calculate the mass of propanone needed to prepare this standard solution. [ $A_r$ : C, 12.0; H, 1.0; O, 16.0] **(3 marks)**

Please write your answer below.

(b) Solutions A, B and C need to be added in a specific order and the clock started as the third solution is added. Suggest the best order of adding the solutions and explain your choice. **(2 marks)**

Please write your answer below.

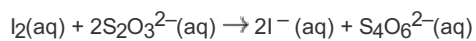
(c) Each  $10.0 \text{ cm}^3$  portion of mixture removed from the main reaction is added to a separate solution of sodium hydrogencarbonate,  $\text{NaHCO}_3(\text{aq})$ , in a conical flask to remove  $\text{H}^+(\text{aq})$  ions. Which piece of apparatus should be used to transfer each  $10.0 \text{ cm}^3$  portion of mixture to the conical flask? (1 mark)

.....  
Please write your answer below.

(d) Suggest two reasons why  $\text{NaHCO}_3(\text{aq})$  is preferred to  $\text{NaOH}(\text{aq})$  as the reagent used to remove  $\text{H}^+(\text{aq})$  ions. **(2 marks)**

.....  
Please write your answer below.

(e) The unreacted iodine in each  $10.0 \text{ cm}^3$  portion of the mixture is titrated against  $0.100 \text{ mol dm}^{-3}$  aqueous thiosulfate ions,  $\text{S}_2\text{O}_3^{2-}(\text{aq})$ , to determine the concentration of  $\text{I}_2(\text{aq})$  in the mixture at the time that the  $10.0 \text{ cm}^3$  portion was withdrawn.



A  $10.0 \text{ cm}^3$  portion of mixture is removed at time = 0. This is before any of the  $0.200 \text{ mol dm}^{-3}$   $\text{I}_2(\text{aq})$  had reacted.

Calculate the volume of  $0.100 \text{ mol dm}^{-3}$   $\text{S}_2\text{O}_3^{2-}(\text{aq})$  needed to react with the iodine present in this  $10.0 \text{ cm}^3$  portion of mixture. **(3 marks)**

Please write your answer below.



(f) Suggest the name of a suitable indicator to use in the titration and state its colour change. **(2 marks)**

.....  
Please write your answer below.

(g) State two variables which must be recorded in this experiment. For each variable, state the units. **(2 marks)**

.....  
Please write your answer below.

(h) State one other variable which must be controlled in this experiment. **(1 mark)**

.....  
Please write your answer below.

(i) A student suggested that the temperature at which the experiment was carried out would affect the order of reaction with respect to iodine. State if the student was correct and explain your answer. **(2 marks)**

Please write your answer below.

--- END OF QUESTION PAPER ---

## Answer Key

No	Question Type	QID	Correct Answer
Question - 1	Multiple Choice (Radiobutton)	364	D
Question - 2	Multiple Choice (Radiobutton)	365	B
Question - 3	Multiple Choice (Radiobutton)	366	C
Question - 4	Multiple Choice (Radiobutton)	367	A
Question - 5	Multiple Choice (Radiobutton)	368	C
Question - 6	Multiple Choice (Radiobutton)	369	D
Question - 7	Multiple Choice (Radiobutton)	370	B
Question - 8	Multiple Choice (Radiobutton)	371	D
Question - 9	Multiple Choice (Radiobutton)	372	C
Question - 10	Multiple Choice (Radiobutton)	373	C
Question - 11	Essay (Evaluted by Admin)	374	Essay Type Question
Question - 12	Essay (Evaluted by Admin)	375	Essay Type Question
Question - 13	Essay (Evaluted by Admin)	376	Essay Type Question
Question - 14	Essay (Evaluted by Admin)	377	Essay Type Question
Question - 15	Essay (Evaluted by Admin)	378	Essay Type Question
Question - 16	Essay (Evaluted by Admin)	379	Essay Type Question
Question - 17	Essay (Evaluted by Admin)	380	Essay Type Question
Question - 18	Essay (Evaluted by Admin)	381	Essay Type Question
Question - 19	Essay (Evaluted by Admin)	382	Essay Type Question

--- END OF ANSWER KEY ---