ALBERTA CHEM 265 · FULL COURSE · 50 QUESTIONS

Full Course — Practice Test

This practice test was made by AI and there may be mistakes. If a question or answer looks wrong, use the Flag a mistake button to let Brett know so he can fix it.

1 **Which compound is aromatic because its ring has 6 π electrons in a planar conjugated ring**

A Cyclohexene

B Pyrrole

C Cyclopentane

D Cyclooctatetraene

Understand It with Pulse | Flag a mistake

2 **A planar fully conjugated ring is aromatic when its π electron count equals**

- A 4n
- B 4n+1
- C 4n+2
- D Any even number

Understand It with Pulse | Flag a mistake

3 **Which ring would be antiaromatic if it were planar and fully conjugated**

- A Cyclobutadiene
- B Benzene
- C Naphthalene
- D Pyrrole

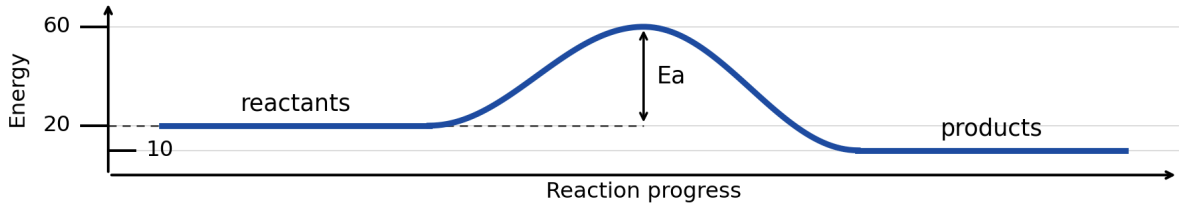
Understand It with Pulse | Flag a mistake

4 **The active electrophile in the nitration of benzene with nitric and sulfuric acids is**

- **A** NO_2^-
- **B** HNO_3
- **C** NO^+
- **D** NO_2^+

Understand It with Pulse | Flag a mistake

5 **The energy diagram for a reaction is shown. The reaction is**



- **A** Exothermic
- **B** Endothermic
- **C** Neutral
- **D** Reversible only

Understand It with Pulse | Flag a mistake

6 **Which substituent is both deactivating and meta directing**

A OCH_3

B CH_3

C OH

D NO_2

Understand It with Pulse | Flag a mistake

7 **A Friedel Crafts alkylation generally fails on which ring**

A Toluene

B Nitrobenzene

C Anisole

D Xylene

Understand It with Pulse | Flag a mistake

8 **Heating ethylbenzene with strong potassium permanganate gives mainly**

A Phenylacetic acid

B Acetophenone

C Benzoic acid

D Phenol

Understand It with Pulse | Flag a mistake

9 **The major product of monobromination of anisole is**

A 3 Bromoanisole

B Bromobenzene

C 4 Bromoanisole

D Benzyl bromide

Understand It with Pulse | Flag a mistake

10 **In nucleophilic addition to an aldehyde, the nucleophile attacks the**

- **A** Carbonyl carbon
- **B** Carbonyl oxygen
- **C** Alpha carbon only
- **D** Aldehyde hydrogen

Understand It with Pulse | Flag a mistake

11 **The titration curve shown gives pH against volume of base added. The volume at which the pH reaches 10 is**

- **A** 20 mL
- **B** 25 mL
- **C** 30 mL
- **D** 40 mL

Understand It with Pulse | Flag a mistake

12 **Ethanal with excess methanol and acid catalyst gives mainly**

A Ethanoic acid

B 1,1-Dimethoxyethane

C Dimethyl ether

D Ethyl methyl ether

Understand It with Pulse | Flag a mistake

13 **Benzaldehyde reacting with a primary amine and loss of water gives a**

A Amide

B Enamine

C Oxime

D Imine

Understand It with Pulse | Flag a mistake

14 **Propanone with methylmagnesium bromide then aqueous workup gives**

A Propan2ol

B $(CH_3)_3COH$

C Ethanol

D Butan2ol

Understand It with Pulse | Flag a mistake

15 **Sodium borohydride in methanol converts cyclohexanone mainly to**

A Cyclohexane

B Benzene

C Cyclohexanol

D Cyclohexene

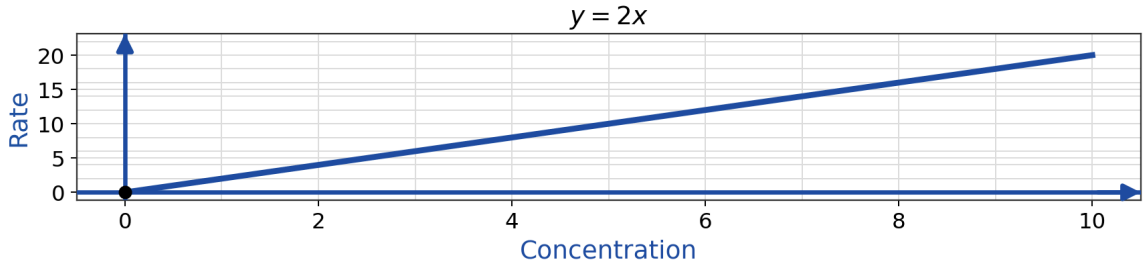
Understand It with Pulse | Flag a mistake

16 **Propanal oxidized with acidic dichromate gives mainly**

- **A** Propanoic acid
- **B** Propanone
- **C** Propane
- **D** Propanol

Understand It with Pulse | Flag a mistake

17 **The graph shows the rate of a reaction against concentration. When the concentration doubles, the rate**



- **A** is unchanged
- **B** is halved
- **C** doubles
- **D** is quadrupled

Understand It with Pulse | Flag a mistake

18 **Formaldehyde with ethylmagnesium bromide then workup gives**

A Ethanol

B Propan2ol

C Propan1ol

D Butan1ol

Understand It with Pulse | Flag a mistake

19 **An enolate forms from a ketone when a strong base removes**

A The carbonyl oxygen

B An alpha hydrogen

C A carbonyl hydrogen

D The carbonyl carbon

Understand It with Pulse | Flag a mistake

20 **Two molecules of ethanal under dilute base give the aldol product**

- A Butanal
- B Butan2ol
- C Butanoic acid
- D 3-Hydroxybutanal

Understand It with Pulse | Flag a mistake

21 **Heating 3-hydroxybutanal loses water to give mainly**

- A Butanal
- B But2-enal
- C Butanone
- D Butanoic acid

Understand It with Pulse | Flag a mistake

22 **The alpha hydrogens of a ketone are relatively acidic because the conjugate base is**

A Stabilized only by steric relief

B A strong oxidizing agent

C Unable to bear a charge

D Resonance stabilized as an enolate

Understand It with Pulse | Flag a mistake

23 **The titration curve shown gives pH against volume of base added. The pH when 15 mL of base have been added is**

A 4

B 9

C 11

D 3

Understand It with Pulse | Flag a mistake

24 **Which acid is the strongest**

- A CH_3COOH
- B CH_3CH_2COOH
- C CCl_3COOH
- D CH_3CH_2OH

Understand It with Pulse | Flag a mistake

25 **Ethanoic acid with ethanol and acid catalyst gives the Fischer esterification product**

- A Diethyl ether
- B Acetamide
- C Ethyl ethanoate
- D Ethyl benzoate

Understand It with Pulse | Flag a mistake

26 **A carboxylic acid shaken with sodium bicarbonate solution will**

A Form an acid chloride

B Release carbon dioxide gas

C Form an alkene

D Give a silver mirror

Understand It with Pulse | Flag a mistake

27 **The most reactive derivative toward nucleophilic acyl substitution is an**

A Amide

B Ester

C Anhydride

D Acid chloride

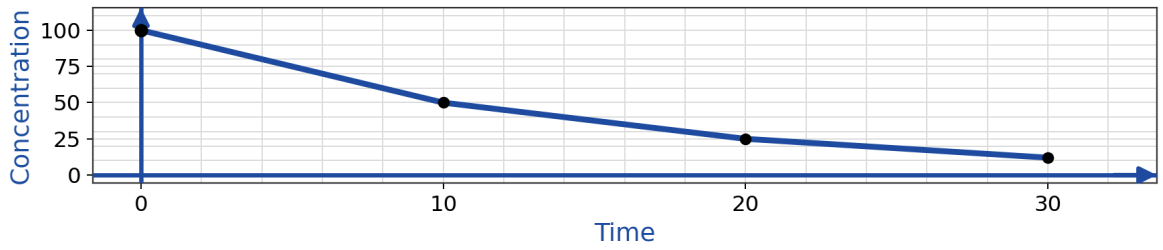
Understand It with Pulse | Flag a mistake

28 **The least reactive derivative toward nucleophilic acyl substitution is an**

- **A** Amide
- **B** Acid chloride
- **C** Anhydride
- **D** Ester

Understand It with Pulse | Flag a mistake

29 **The graph shows concentration against time for a reaction. The time for the concentration to fall to half its initial value is**



- **A** 5
- **B** 10
- **C** 20
- **D** 30

Understand It with Pulse | Flag a mistake

30 **Basic hydrolysis of ethyl ethanoate gives**

A Sodium ethanoate and ethanol

B Ethanoic acid and ethane

C Sodium ethoxide and methane

D Acetyl chloride and water

Understand It with Pulse | Flag a mistake

31 **Heating a nitrile in aqueous acid ultimately gives a**

A Primary amine

B Alkene

C Carboxylic acid

D Primary alcohol

Understand It with Pulse | Flag a mistake

32 **A carboxylic acid is converted to an acid chloride using**

- A $NaBH_4$
- B $SOCl_2$
- C $LiAlH_4$
- D PCC

Understand It with Pulse | Flag a mistake

33 **Which compound is the strongest base in water**

- A Ethylamine
- B Aniline
- C Acetamide
- D Pyrrole

Understand It with Pulse | Flag a mistake

34 **Aniline is a much weaker base than cyclohexylamine because its lone pair is**

A Blocked by a methyl group

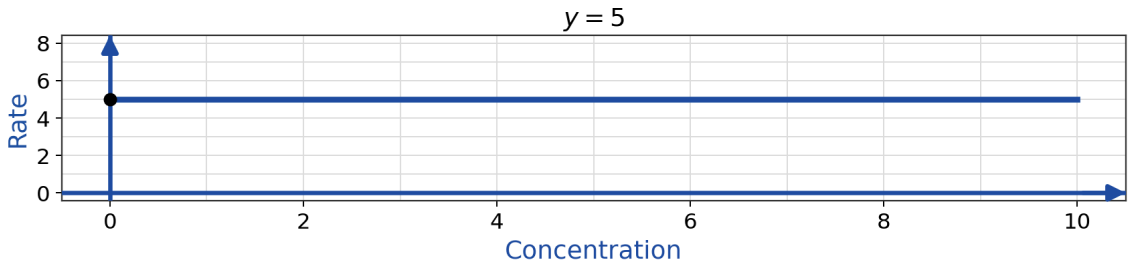
B Delocalized into the aromatic ring

C Shared in a peptide bond

D Removed by protonation of carbon

Understand It with Pulse | Flag a mistake

35 **The graph shows the rate of a reaction against concentration. The rate**



- **A** increases with concentration
- **B** is independent of concentration
- **C** falls to zero at high concentration
- **D** doubles when concentration doubles

Understand It with Pulse | Flag a mistake

36 **Aniline with nitrous acid at low temperature forms**

- **A** Nitrobenzene
- **B** Chlorobenzene
- **C** A diazonium salt
- **D** Benzamide

Understand It with Pulse | Flag a mistake

37 **Glucose is best classified as an**

- A Ketohexose
- B Aldohexose
- C Aldopentose
- D Ketopentose

Understand It with Pulse | Flag a mistake

38 **In a Fischer projection of a D sugar, the hydroxyl group on the highest numbered stereocentre points**

- A To the left
- B Upward
- C Downward
- D To the right

Understand It with Pulse | Flag a mistake

39 **The alpha and beta anomers of glucose differ in configuration only at the**

A Second carbon

B Fourth carbon

C Anomeric carbon

D Sixth carbon

Understand It with Pulse | Flag a mistake

40 **Starch is a polymer of glucose units joined mainly by**

A Glycosidic bonds

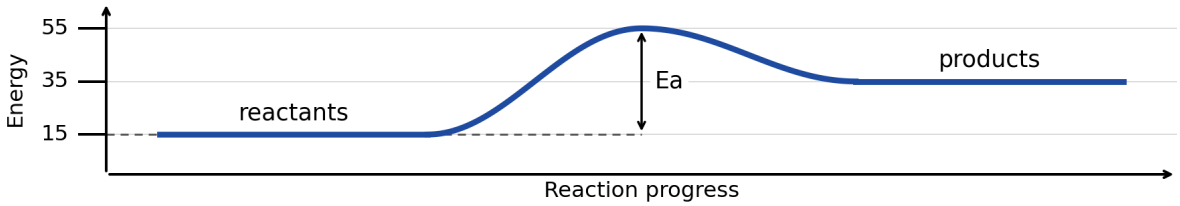
B Peptide bonds

C Ester bonds

D Phosphodiester bonds

Understand It with Pulse | Flag a mistake

41 **The energy diagram for a reaction is shown. Compared with the reactants, the products are at**



A a lower energy

B a higher energy

C the same energy

D zero energy

Understand It with Pulse | Flag a mistake

42 **The isoelectric point of an amino acid is the pH at which it has**

A Zero net charge

B Two positive charges

C No ionized groups

D Maximum solubility in hexane

Understand It with Pulse | Flag a mistake

43 **A peptide bond joining two amino acids is a type of**

A Ester bond

B Amide bond

C Glycosidic bond

D Hydrogen bond

Understand It with Pulse | Flag a mistake

44 **The primary structure of a protein is its**

A Alpha helix content

B Beta sheet content

C Overall three dimensional fold

D Amino acid sequence

Understand It with Pulse | Flag a mistake

45 **A triglyceride consists of glycerol joined to three fatty acids by**

- **A** Peptide bonds
- **B** Glycosidic bonds
- **C** Phosphodiester bonds
- **D** Ester bonds

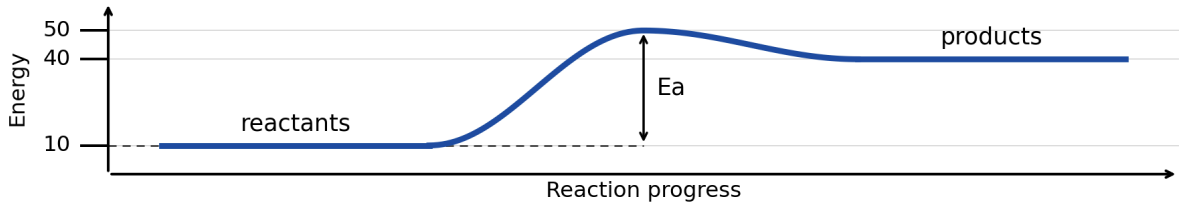
Understand It with Pulse | Flag a mistake

46 **Each nucleotide in a nucleic acid is made of a phosphate, a pentose sugar, and a**

- **A** Fatty acid
- **B** Amino acid
- **C** Nitrogenous base
- **D** Glucose unit

Understand It with Pulse | Flag a mistake

47 **The energy diagram for a reaction is shown. The double arrow labelled Ea measures the difference between**



- **A** the peak and the products
- **B** the reactants and the products
- **C** the peak and the reactants
- **D** the reactants and zero

Understand It with Pulse | Flag a mistake

48 **A broad infrared absorption between 3200 and 3600 cm^{-1} suggests an**

- **A** Alkane only
- **B** Alcohol hydroxyl group
- **C** Acid chloride
- **D** Nitrile group

Understand It with Pulse | Flag a mistake

49 **Ignoring exchange, ethanol shows how many distinct proton environments in its proton NMR spectrum**

- A 3
- B 1
- C 2
- D 6

Understand It with Pulse | Flag a mistake

50 **A proton NMR signal coupled to two equivalent neighbouring protons appears as a**

- A Doublet
- B Triplet
- C Quartet
- D Singlet

Understand It with Pulse | Flag a mistake

ANSWER KEY

1. B
2. C
3. A
4. D
5. A
6. D
7. B
8. C
9. C
10. A
11. C
12. B
13. D
14. B
15. C
16. A
17. C
18. C
19. B
20. D
21. B
22. D
23. B
24. C
25. C
26. B
27. D
28. A
29. B
30. A
31. C
32. B
33. A
34. B
35. B
36. C
37. B
38. D
39. C
40. A
41. B
42. A
43. B
44. D
45. D
46. C
47. C
48. B
49. A
50. B

© 2026 Brett Robbins. All Rights Reserved.