



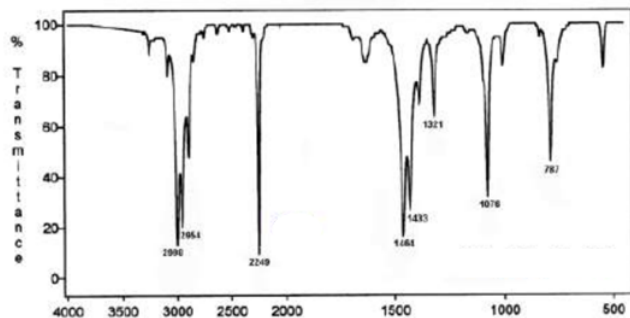
قائمة الاسئلة

امتحان نهاية الفصل الدراسي الأول - للعام الجامعي 1446 هـ - كلية العلوم :: كيمياء عضوية (14) [التحليل الطيفي العضوي] - (303108) -
صادق حمود صالح عزام

1) The ^{13}C NMR advanced technique graph that determine only CH as negative peak is

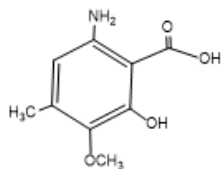
- 1) - DEPT 135
- 2) - DEPT 45
- 3) - DEPT Coupling
- 4) + DEPT 90

2) Organic molecule has M.f ($\text{C}_3\text{H}_5\text{N}$) has been analysed using ^1H NMR and IR spectronic techniques gives the data. ^1H NMR ppm: 1.1 (3H, t), 2.8 (2H, q) and IR chart as follow find out structure formula استنتج التركيب الكيميائي



- 1) - CCCCN
- 2) - CC(C)C#N
- 3) + CCNC#N
- 4) - CC#CC

3) Apply Woodward Fieser rules to calculate λ_{max} of the following compounds



- 1) - 276 nm
- 2) + 267 nm
- 3) - 367 nm
- 4) - 257 nm



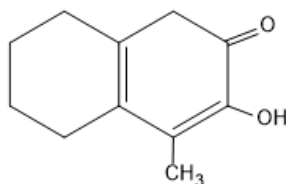


- 4) The difference between the frequency of the given proton two the reference TMS this is the definition of number of signals
- 1) - TRUE.
 - 2) FALSE.
- 5) The shifting of the absorption peak in UV-Vis spectrum toward short wave length is hypsochromic
- 1) TRUE.
 - 2) - FALSE.
- 6) KBr desk film in IR- spectrum is used when the sample is liquid
- 1) - TRUE.
 - 2) FALSE.
- 7) The must useful ionization chamber that used to generate molecular parent ion in Mass- spectrum is
- 1) Electron Impact (E I)
 - 2) - Chemical Ionization (C I)
 - 3) - Fast Atom Bombardment (F A B)
 - 4) - None of the is correct
- 8) CH₃-Br will give two peaks for the isotope of Br in Mass- spectrum in ratio is equal to
- 1) - 1 : 2
 - 2) - 1 : 3
 - 3) - 2:00
 - 4) 1 : 1
- 9) Base peak in secondary alcohol in the fragmentation of alcohol in Mass-Spectrum is equal to
- 1) - m/z 31
 - 2) m/z 45
 - 3) - m/z 59
 - 4) - m/z 43
- 10) The base peak that appears in Mass-Spectrum for the fragmentation of Ketone is equal to 43 is this
- 1) TRUE.
 - 2) - FALSE.
- 11) The most important peak in Mass-Spectrum that shows the most stable daughter is molecular parent M⁺ peak
- 1) - TRUE.
 - 2) FALSE.
- 12) When the ¹H NMR of acetone resonance in 200 MHz operating system is equal 2.1 ppm what is the resonance is equal in unit of Hz اذا 2.1 ppm رنين يعطي الاسيتون اذا 200MHz جهاز في 2.1 ppm ب يساوي كم HZ
- 1) 420 HZ
 - 2) - 200 Hz
 - 3) - 300 HZ
 - 4) - None of them
- 13) CH₃-CH₂ the coupling of CH₃ in ¹³C NMR broad band coupling according to splitting rule (n+1)
- 1) - Triplet
 - 2) - Singlet
 - 3) Quartet
 - 4) - Doublet
- 14) How many peake do you expect for the molecule of 2-metyl-2-butene in ¹³C NMR -spectrum
- 1) - 4 signals
 - 2) 5 signals
 - 3) - 3 signals
 - 4) - 2 signals
- 15)





Using Woodward – Fieser rule calculate λ_{\max} for this α,β -unsaturated molecule



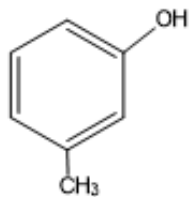
- 1) - 305 nm
 - 2) - 316 nm
 - 3) + 355 nm
 - 4) - 330 nm
- 16) ¹HNMR spectrometric system operating in 200 MHz gives peak at 1454 Hz for CHCl₃ convert this to chemical shift in ppm
- 1) + 7.27 ppm
 - 2) - 4.45 ppm
 - 3) - 4.84 ppm
 - 4) - 3.63 ppm
- 17) The effective magnetic field generated by nucleus is greater than the magnetic field of applied operating magnetic field $H_{\text{eff}} > H_0$ is
- 1) - Shielding
 - 2) - Chemical shift
 - 3) + Deshielding
 - 4) - Anisotropic
- 18) If the operating system used in ¹HNMR is 400 MHz then the operating system used in ¹³CNMR is
- 1) + 100 MHz
 - 2) - 25 MHz
 - 3) - 125 MHz
 - 4) - 50 MHz
- 19) We can distinguish the substituent in benzene ring in ¹HNMR spectrum if the substituent at(ortho) position using J-Coupling which give values equal to
- 1) - J = 1 - 3 Hz
 - 2) - J = 3 - 7 Hz
 - 3) + J = 6 - 9 Hz
 - 4) - J = 0 - 1 Hz
- 20) IR-spectrum peak band of carbonyl C=O group of aldehyde will appear at
- 1) - 1735 cm⁻¹
 - 2) - 1695 cm⁻¹
 - 3) - 1715 cm⁻¹
 - 4) + 1725 cm⁻¹
- 21) How can you distinguish between 2-propanone as ketone and aldehyde propanal using ¹³CNMR- spectrum if both have same M.F
- 1) - Position of C=O of both ketone & aldehyde
 - 2) - Ketone give 2 signals only
 - 3) - Aldehyde give 3 signals
 - 4) + All answer are correct
- 22) Deduce the structure formula of compound has M.F(C₇H₉O) if it has



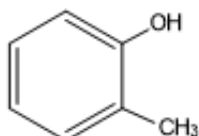


given the following data of FT- IR spectrum as follow: IR cm^{-1} : 3550, 3040, ,
, 2995 , 1618, 1520 , 1347, 1200 , 746,

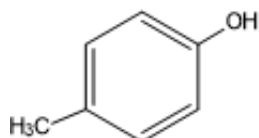
1) -



2) +

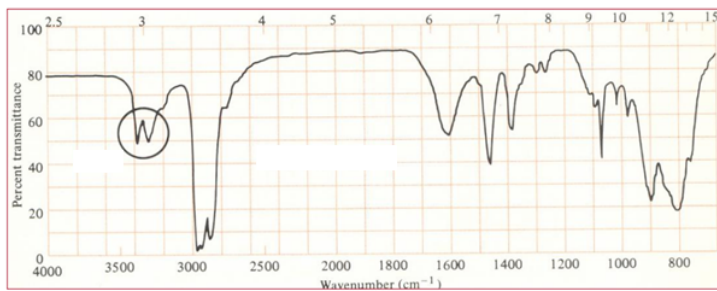


3) -

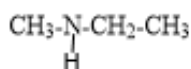


4) - None of them correct

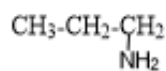
23) The IR- spectrum of a compound with formula $\text{C}_3\text{H}_9\text{N}$ is shown peaks at 3423, 3257, 1610, 1446, 1354 cm^{-1} . ^1NMR δ ppm: 0.95(3H, t), 1.7(2H, Sixet), 2.3(2H, t), 3.5(2H, singlet). Draw the structure of this compound.



1) -

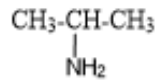


2) +



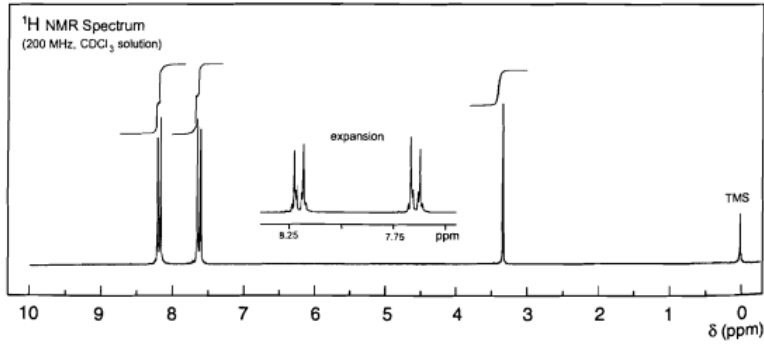
3) -



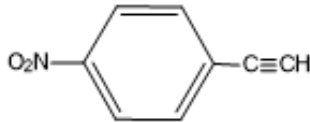


4) - None of them correct

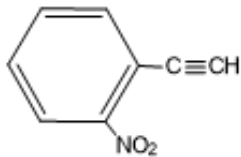
24) Organic compound has M.F ($\text{C}_8\text{H}_5\text{NO}_2$) gives IR-data cm^{-1} : 3300, 3070, 2995, 2105, 1620, 1551, 1350, 830cm^{-1} and ^1H NMR chart as below predict the structure formula



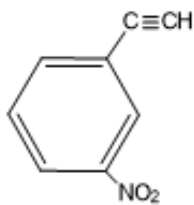
1) +



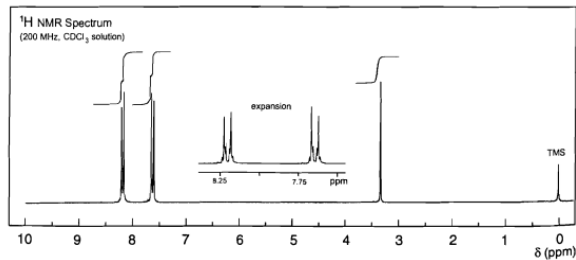
2) -



3) -



4) - Organic compound has M.F ($\text{C}_8\text{H}_5\text{NO}_2$) gives IR-data cm^{-1} : 3300, 3070, 2995, 2105, 1620, 1551, 1350, 830cm^{-1} and ^1H NMR chart as below predict the structure formula





25) One of the factors that affecting chemical shift

- 1) - Vander waals
- 2) - Inductive effect
- 3) - anisotropic
- 4) All answers are correct

26) a compound has C_3H_6O contain $C=O$ gives three peaks in 1H NMR whether this compound is

- 1) Aldehyde
- 2) - Ketone
- 3) - Alcohol
- 4) - Ether

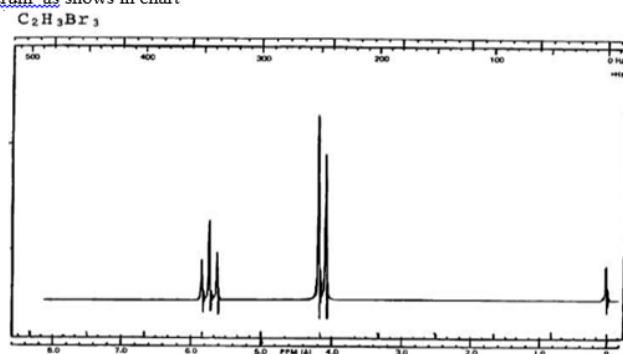
27) 1H NMR of dichloropropane gives two signals of triplet & one signal quantet whether this compound is

- 1) - 1,1-Dichloropropane
- 2) - 1,2-Dichloropropane
- 3) 1,3-Dichloropropane
- 4) - 2,2-Dichloropropane

28) How many signals in 1H NMR spectrum will be appeared of this compound $CH_3-CO-CHCl_2$.

- 1) - 3 signals
- 2) 2 signals
- 3) - 1 signals
- 4) - 4 signals

29) This compound $C_2H_3Br_3$ gives two signal one doublet and another triplet in 1H NMR spectrum as shows in chart



- 1) 1,1,2-Tribromoethane
- 2) - 1,1,1-Tribromoethane
- 3) - 1,2,3- Tribromopropane
- 4) - None of them correct

30) In IR-Spectrum of disubstituted benzene at meta position will give peaks at out of plane OOP

- 1) - 820 cm^{-1}
- 2) - 663 and 776 cm^{-1}
- 3) 673, 765, and 910 cm^{-1}
- 4) - No peak

