

Unit 8 - Week 7

Course outline

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Electronic Spectra of Diatomic Molecules & UV-Vis Spectroscopy

UV-Visible Spectroscopy of Conjugated Molecules

UV-Vis Spectroscopy & its Applications

 Quiz : Assignment 7

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Assignment 7

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.

Due on 2019-09-18, 23:59 IST.

1) For a particle in 1D box, the wavefunction is given by:

1 point

$$\psi(x) = N \sin \frac{3\pi x}{L} \quad 0 < x < L$$

$$= 0 \quad x < 0 \text{ \& } x > L$$

The normalization constant is given by:

- $\sqrt{\frac{1}{L}}$
 $\sqrt{\frac{2}{L}}$
 $\sqrt{\frac{3}{L}}$
 $\sqrt{\frac{4}{L}}$

No, the answer is incorrect. Score: 0

Accepted Answers:

$$\sqrt{\frac{2}{L}}$$

 2) Term symbol for the σ^2 electronic configuration is:

1 point

- $^3\Sigma^+$
 $^1\Sigma^-$
 $^1\Sigma^+$
 $^3\Sigma^-$

No, the answer is incorrect. Score: 0

Accepted Answers:

$$^1\Sigma^+$$

3) d-d transitions are forbidden but we see them due to

1 point

- vibronic coupling
 Charge-transfer
 Centrosymmetry in molecule
 None of the above

No, the answer is incorrect. Score: 0

Accepted Answers:

vibronic coupling

 4) Ground term symbol for d^2 configuration is:

1 point

- 1G
 1S
 3P
 3F

No, the answer is incorrect. Score: 0

Accepted Answers:

$3F$

5) Which is the most significant transition in conjugated systems:

1 point

- $\sigma \rightarrow \sigma^*$
 $n \rightarrow \sigma^*$
 $\pi \rightarrow \pi^*$
 $n \rightarrow \pi^*$

No, the answer is incorrect. Score: 0

Accepted Answers:

$$\pi \rightarrow \pi^*$$

6) What is the effect of increasing conjugation in alkene:

1 point

- Wavelength of $\pi \rightarrow \pi^*$ increases
 Wavelength of $\pi \rightarrow \pi^*$ decreases
 No effect on $\pi \rightarrow \pi^*$ wavelength
 Wavelength of $\sigma \rightarrow \sigma^*$ decreases

No, the answer is incorrect. Score: 0

Accepted Answers:

 Wavelength of $\pi \rightarrow \pi^*$ increases

7) Resonance condition for electron resonating in a cyclic conjugated molecule is:

1 point

- $\pi R = n\lambda$
 $2\pi R = n\lambda$
 $2\pi R = \frac{n}{\lambda}$
 $\pi R = n/\lambda$

No, the answer is incorrect. Score: 0

Accepted Answers:

$$2\pi R = n\lambda$$

8) Arrange red, blue, green and yellow quantum dots according to their sizes:

1 point

- Blue < Green < Yellow < Red
 Red < yellow < Green < Blue
 Blue < Green < Red < Yellow
 Green < Blue < Yellow < Red

No, the answer is incorrect. Score: 0

Accepted Answers:

Blue < Green < Yellow < Red

 9) Guanosine has a maximum absorbance of 275 nm. $\epsilon_{275}=8400M^{-1}cm^{-1}$ and the path length is 1 cm. find the concentration of guanosine if $A^{275}=0.70$.

1 point

- 8.33×10^{-5} mol/L
 2.33×10^{-5} mol/L
 5.66×10^{-5} mol/L
 1.4×10^{-5} mol/L

No, the answer is incorrect. Score: 0

Accepted Answers:

$$8.33 \times 10^{-5} \text{ mol/L}$$

 10) There is a substance in a solution (4 g/mL). The length of cuvette is 2 cm and only 50% of the certain light beam is transmitted. What is the extinction coefficient (in cm^2g^{-1})?

1 point

- .0376
 .012
 .056
 .044

No, the answer is incorrect. Score: 0

Accepted Answers:

$$.0376$$

11) In a Quantum Well electron is confined to how many dimensions?

1 point

- One
 Two
 Three
 Four

No, the answer is incorrect. Score: 0

Accepted Answers:

One

12) Reason for deviation from Lambert- Beer Law:

1 point

- Particles are too close
 Particles are distant
 Low Concentration
 Presence of Monomeric Species

No, the answer is incorrect. Score: 0

Accepted Answers:

Particles are too close

 13) The absorption coefficient of a glycogen-iodine complex is 0.20 (in cm^2g^{-1}) at light of 450 nm. What is the concentration (in g/mL) when the transmission is 40 % in a cuvette of 2 cm?

1 point

- .994
 .785
 .656
 .252

No, the answer is incorrect. Score: 0

Accepted Answers:

$$.994$$

14) Which of the following is true about Quantum Dots?

1 point

- They are semiconductors of Nano scales
 Obey Classical Mechanics
 Don't exhibit energy band gap that determines Radiation absorption and emission spectra
 They are insulators

No, the answer is incorrect. Score: 0

Accepted Answers:

They are semiconductors of Nano scales

15) The energy gap in quantum dot _____ with _____ in size of Quantum dot

1 point

- Increase, Decrease
 Increase , Increase
 Decrease, decrease
 No effect

No, the answer is incorrect. Score: 0

Accepted Answers:

Increase, Decrease