

# Unit 12 - Attosecond Chemical Dynamics – Experimental Point of View

## Course outline

How to access the portal?

Introduction and Mathematical Representation

Nonlinear Effects

Dispersion Effects and Transverse Electromagnetic Mode

Construction of Ultrafast Laser and Measurement of Pulses

Measurement Techniques in Ultrafast Spectroscopy, and their kinetic and quantum mechanical models

Ultrafast Processes in Physical Chemistry – Photophysics, Photochemistry, Solid State, Transition Metal Complexes and Biomolecules

Maxwell's Equations

Ab Initio Molecular Dynamics of Photochemistry and Photophysics – Part 1

Ab Initio Molecular Dynamics of Photochemistry and Photophysics – Part 2

Attosecond Chemical Dynamics – Theoretical Point of View

Attosecond Chemical Dynamics – Experimental Point of View

Attosecond Chemical Dynamics 3

Attosecond Chemical Dynamics 4

Quiz : Week11 Assignment

Femtochemistry of Nanocatalysis

## Week11 Assignment

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

**Due on 2019-10-16, 23:59 IST.**

1) What is true for a catalytic reaction?

2 points

- activation energy is suppressed  
 reaction rate is increased  
 catalyst is not consumed in the reaction  
 all true

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
*all true*

2) What is the typical time scale for heat exchange between electron and phonon baths?

2 points

- 1 fs  
 1 ps  
 1 ns  
 1  $\mu$ s

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
*1 ps*

3) phase-matching in HHG is primarily controlled by (review)

2 points

- pressure of the gaseous medium  
 thickness of the nonlinear crystal  
 refractive index of plasma  
 temperature of the medium.

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
*pressure of the gaseous medium*

4) Molecular electrostatic potential includes potential (review)

1 point

- due to electron-electron interaction  
 due to electron-nuclei interaction  
 due to both electron-electron and electron-nuclei interaction  
 due to none of above

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
*due to both electron-electron and electron-nuclei interaction*

5) Which one of the following is true? (review)

1 point

- Frenkel excitons typically exhibit larger exciton binding energies than Mott-Wannier exciton  
 Mott-Wannier exciton binding energies are not comparable to the thermal energy  $kT$   
 Frenkel excitons binding energies are comparable to the thermal energy  $kT$   
 Mott-Wannier exciton typically exhibit larger exciton binding energies than Frenkel excitons.

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
*Frenkel excitons typically exhibit larger exciton binding energies than Mott-Wannier exciton*

6) Which one of the following is true? (review)

1 point

- Frenkel excitons typically exhibit larger exciton binding energies than Mott-Wannier exciton  
 Mott-Wannier exciton binding energies are not comparable to the thermal energy  $kT$   
 Frenkel excitons binding energies are comparable to the thermal energy  $kT$   
 Mott-Wannier exciton typically exhibit larger exciton binding energies than Frenkel excitons.

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
*Frenkel excitons typically exhibit larger exciton binding energies than Mott-Wannier exciton*

7) Typical lifetime of Plasmon of a nanoparticle is (review)

1 point

- 2 ps  
 2 ns  
 2 fs  
 2  $\mu$ s

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
*2 fs*

8) Rate of IC and ISC can be comparable in a photochemical process due to (review)

1 point

- strong spin-spin coupling  
 strong spin-orbit coupling  
 strong orbital angular momentum  
 strong spin angular momentum

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
*strong spin-spin coupling*

You were allowed to submit this assignment only once.