Synthesis of Nanomaterials VTU CBCS Question Paper Set 2018

USN | | | | | | | | | | |

10NT61

Sixth Semester B.E. Degree Examination, June/July 2016
Synthesis of Nanomaterials

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 a. Explain sol-gel process? How to synthesize the nano particles with suitable examples and its advantages. **(10 Marks)**

b. Illustrate the mechanical alloying and mechanical milling with suitable flow chart. **(10 Marks)**

2 a. Explain PVD (Pressure Vapour Deposition) method with suitable examples and write a note on MBE. **(10 Marks)**

b. How to prepare the Langmuir – Blodgett film (LBF) and its applications. **(10 Marks)**

3 a. Write a short note an nano manipulation and nano lithography. **(10 Marks)**

b. Write a note on assembly of nano particles and nano-wires. **(10 Marks)**

4 a. Explain the VLS growth and size control of nanowires with suitable examples. **(10 Marks)**

b. Illustrate the chemical vapour Deposition (CVD) with suitable reactions to synthesize the nanomaterials. **(10 Marks)**

PART – B

5 a. Explain the Preparation of nano fibres by electro-spinning and its uses. **(10 Marks)**

b. Explain the general process of Reverse micelle. Explain any two factors affecting the particle size. **(10 Marks)**

6 a. How to synthesize the metal oxide nanoparticles by using co-precipitation? Explain with suitable mechanism. **(10 Marks)**

b. Explain the general method of chemical reduction with suitable flow chart. **(10 Marks)**

7 a. Explain the Preparation of colloidal nanoparticales by using photochemical method and explain the role of light sources. **(10 Marks)**

b. Brief about Hydrothermal method and role of water in the reaction medium. Mention the merits and characteristics of Hydrothermal method. **(10 Marks)**

8 a. How to synthesize the nano metal oxide by using solution combustion method? Explain with suitable example. **(10 Marks)**

b. Mention the differences between spray pyrolysis and flame spray pyrolysis. **(10 Marks)**

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PART – A

1 a. What is the principle of sol-gel process? Explain synthesis of nano-structured materials by sol-gel method. **(08 Marks)**

b. Write a note on mechanical milling. **(05 Marks)**

c. Explain inert gas condensation technique with neat diagram. **(07 Marks)**

2 a. Explain laser pyrolysis with example. **(08 Marks)**

b. Explain in brief physical vapor deposition method. **(06 Marks)**

c. Discuss Langmuir-Blodgett technique. **(06 Marks)**

3 a. What is nanomanipulation? Explain nanolithography. Mention its applications. **(10 Marks)**

b. Write a note on sol-gel lithography. **(10 Marks)**

4 a. Discuss the VLS growth of nanowires with example. **(08 Marks)**

b. Discuss the role of precursors and catalysts in VLS growth. **(06 Marks)**

c. Explain CVD technique. **(06 Marks)**

PART – B

5 a. Explain the process of template filling. **(08 Marks)**

b. Write a note on:

(i) Reverse micelles method.

(ii) Electrophoretic deposition. **(12 Marks)**

6 a. Explain the following:

(i) Co-precipitation method.

(ii) Arrested precipitation method. **(12 Marks)**

b. Discuss chemical reduction method. **(08 Marks)**

7 a. Discuss electrochemical synthesis of nanomaterials. **(08 Marks)**

b. What is sonochemical synthesis? Explain. **(08 Marks)**

c. Distinguish between hydrothermal and solvothermal processes. **(04 Marks)**

8 a. Explain solution combustion process. **(06 Marks)**

b. Write a note on chemical vapor condensation. **(08 Marks)**

c. Discuss the fundamental aspects of SLS process. **(06 Marks)**

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