

Government Engineering College, Valsad

Chemical Engineering Department

Webinar Title: Application of Nanotechnology

Name of Expert: Dr. Nishant Srivastava

Date of Webinar: 8/6/2020

Time: 5:00 P. M onwards

Faculty Coordinator: Prof. S. K Srivastava and Prof. A.D. Modi

Organising Committee: Prof. H.M.Jariwala, Prof. A.R.Magodara, Prof. A.H.Prajapati

No. of Registered Participants: 40

Guest Profile:

Dr. Nishant Srivastava has done his B.Tech and M.Tech in Biotechnology and Ph. D in Chemical Engineering with specialization in (Nano-biotechnology) from SVNIT Surat. He is also having a Post Graduate Diploma in environmental protection law. He is presently working as Research Scientist and Assistant Professor in department of biotechnology, at Meerut Institute of Engineering and Technology (MIET)

Webinar description:

The Department of Chemical Engineering organized a webinar on “Application of Nanotechnology” on 8th June 2020. The webinar was organized for all students of the chemical engineering department. Prof. S. K Srivastava introduced Dr. Nishant Srivastava to all participants. Dr. Nishant Srivastava started with the introduction of Nanotechnology and its applications. Dr. Nishant Srivastava shared his knowledge and experience on nanoparticles biosynthesis, nano fertilizer and how nanomedicine works. The session ended with a vote of thanks by Prof. S. K Srivastava in appreciation to Dr. Nishant Srivastava for sharing his valuable time for interacting with students and faculties.

Glimpses of Expert lecture

WHY NANOTECHNOLOGY?

- The physical and chemical properties of matter change in the nanoscale.
- These changes involve quantum effects that are not studied during traditional programs.
- In brief, as the size of a particulate approaches the nanoscale, an increasing percentage of the atoms in the material are at the particle surface.
- At a critical point the fundamental properties of matter change.
- The properties that change include basic properties such as a melting point color but of greater importance to pathologists are:
- Potential increases in the physical size of each molecular component as total number of molecular components decreases.
- An increase in the fraction of molecules on the surface of the particle, changes in surface reactivity.

Generalized Flow Chart for Nanoparticle Biosynthesis

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    graph TD
      A[Bioreductant from Bacteria, Fungi, or Algae + Metal ions  
(maybe enzyme/bio-chemical)] --> B[Reactants conc., pH, kinetics, Mixing ratio]
      A --> C[Solution chemistry, interaction time]
      B --> D[Metal nanoparticles in solution]
      C --> D
      D --> E[UV visible analysis  
(SPR), DLS]
      D --> F[Purification and recovery]
      E --> G[Nanoparticle Powder]
      F --> G
      G --> H[SEM, TEM, XRD, FTIR]
      H --> I[Physicochemical Characterization]
      I --> J{Does not meet shape, size, and size distribution criteria}
      I --> K{Meet shape, size, and size distribution criteria}
      J --> L[Modify process variables]
      L --> A
      K --> M[Biofunctionalization]
      M --> N[Final Product]
  
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Advantages of nano medicine

- Drug delivery to the exact location. Lesser side effects.
- Molecular targeting by nano engineered
- Detection is relatively easy.
- No surgery required.
- Diseases can be easily cured.

(E) Schematic of Nanoparticle Separation

Head of Department
 Chemical Engineering Department
 GEC, Valsad