AARUPADAI VEEDU INSTITUTE OF TECHNOLOGY

VINAYAKA MISSIONS RESEARCH FOUNDATION

(DEEMED TO BE UNIVERSITY)

DEPARTMENT OF BIOTECHNOLOGY

TARG – Guest Lecture

Presented by Dr. K. Sathish Kumar, Associate Professor, Department of Chemical Engineering on 09.03.2019

Topic: APPLICATION OF NANOMATERIALS IN PETROCHEMICAL SECTOR

Presented by Dr.K.Sathish Kumar, Professor, Department of chemical engineering on 09.03.2019

He delivered the lecture on nanotechnology and its application.Nanomaterials are the materials which have a size of 10-1000nm but it is usually 1-100nm .Properties of material increase by change by change in size, it has a high surface area to volume ratio, hence it also increases the properties.

Some of the properties of nanomaterial's are: Mechanical properties, Catalytic properties, Magnetic properties, Optical properties. These nanoparticles can be classified as zero dimensional (0-D), one dimensional (1-D), two dimensional (2-D), three dimensional (3-D).

There are two methods for synthesis of nanoparticles:

1. Top down method (Destruction): The top down method includes method such as high energy ball milling, lithography, etc.... These methods are very expensive.

2. Bottom up method (Construction): This method includes physical vapour deposition, chemical vapour deposition, sol gel method, etc...

The method of synthesis of nanoparticles can be classified into three types they are: physical, chemical, biological.The physical method includes ball milling, the chemical method includes sol gel process, solution based synthesis and the biological method includes bacterial, yeast, fungi and plant extract.

There are four characterization techniques of nanomaterials, they are: structural, optical, electric, magnetic.

The amount or presence of nanoparticles can be detected by UV-Visible spectroscopy, FT-IR spectroscopy-ray diffraction, SEM and TEM analysis.

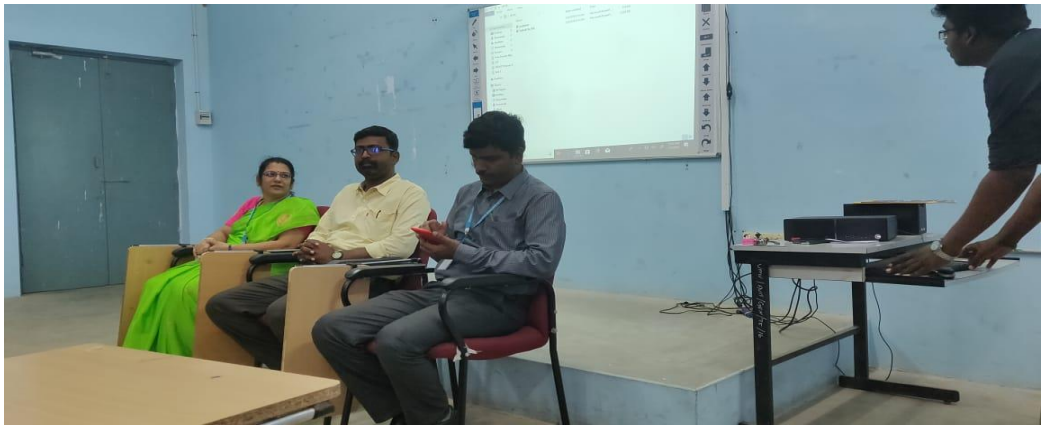
Finally he concluded with Some of the applications of nanotechnology in different fields are:

Information technology: smaller, faster, more energy efficient

Medicine: cancer treatment, bone treatment, drug delivery, medicine development.

Energy: solar cell, fuel cell, battries, biofuels.

Consumer goods: food and breaveges, appliances of consumer goods, textile.




Chemical Vapour Deposition