

KSCSTE sponsored National seminar on “Interdisciplinary Chemical Research”

Organized by the Department of Chemistry, St. Joseph’s College, Irinjalakuda

On 15th & 16th February 2018

There were more than hundred participants from different institutions, out of them ten participants were from outside of Kerala State. The seminar was inaugurated by Dr Pradeepan Periyat (Assistant Professor, Calicut University, recipient of KSCSTE Young Scientist Award 2017) on 15th February (9.30 am) at MMT Hall of St. Joseph’s College Irinjalakuda. Principal Dr Sr Lilly P. L. was chaired the inaugural session. Head of the chemistry department Dr Jessy Immanuel welcomed the gathering, Christ College Principal in charge Dr Mathew Paul felicitated and convenor Dr Manoj A. L. was proposed the official vote of thanks.

The first and the second keynote lectures were delivered by Dr Pradeepan Periyat. In the first lecture on “Fundamentals of Nanomaterials” he has highlighted the interdisciplinary nature of nanoscience and nanotechnology on which research and development activity has been growing explosively worldwide in the past few years. The term nanotechnology comes from the combination of two words: the Greek numerical prefix ‘nanos’ means dwarf referring to one billionth of a meter and the word technology. The field of nanotechnology is rapidly growing and faces numerous challenges to its further growth and development. However, nanotechnology promises the possibility of creating nanostructures having properties including superconductivity and magnetism. Another very important aspect of nanotechnology is the miniaturization of current and new instruments, sensors and machines that will greatly impact the world we live in. In his talk on fundamentals of nanomaterials, preparation, properties and important applications of nanomaterials were discussed. His second lecture on “Black TiO₂ Nanomaterials and its Applications” was focused on the importance of band gap reduction of TiO₂ nanomaterials. Tremendous efforts have been made to synthesize TiO₂ nanomaterials through different methods such as hydrothermal, solvothermal, chemical vapour deposition, sol-gel and electrodeposition. This chemical modification results disordered surface, oxygen vacancies and Ti³⁺ to produce changes in surface, electrical, optical and electronic properties. Changes in electronic property imply bandgap narrowing or midgap states which enhances the visible light absorption and thus high photocatalytic activity.

The post lunch sessions were by Dr Parameswaran P. on the development of computational chemistry from the classical and quantum mechanical laws as well as the use of computational packages to solve chemical problems. How the data obtained from the computational quantum mechanical calculations are used to predict the electronic structure of 2-adamantylidene and its reactivity was explained in the second part of the talk.

On the second day of the National seminar, 16th February, the first keynote lecture was delivered by Dr Nixon Abraham (IISER, Pune) on “Neural Circuits and Behavior: An Interdisciplinary Topic”. In the first part of his talk, he covered the basics of neuronal signaling. Then he explained how neurons generate the electrical activity (the action potentials) and transfer the information from one neuron to the other. In the second part, he explained in detail the techniques that we use to modulate the brain functions with rodent olfactory system as the model to address various questions. Also, he explained the other recent techniques that are used in causal studies of Neuroscience.

Dr. Santhosh S Nair (Stolckhome, Sweden) was the keynote speaker in the second session on the topic “One Dimensional Nanostructures; Synthesis and Applications”. He discussed about the interesting properties of dimensional metal oxide nanostructures such as low grain boundary scattering, enhanced electron transport and large surface to volume ratio with ease of establishing metal-semiconductor junctions. He explained on a new technique to create ohmic and schottky contact on vapour phase polymerized PEDOT by directly growing ZnO nanowire (ZnO NWs) arrays on them.

The post lunch session was wholly dedicated for the paper presentations by participants. The National seminar was concluded with the valedictory function at around 4 pm.

