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BIO-NANOTECHNOLOGY INDIAN CONTEXT

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Nanotechnology has been heralded as a revolutionary technology by many scholars worldwide. Being an enabling technology, it has the potential to open new vistas in the field of R&D in various multiple disciplines and have wide domain of sectoral applications, ranging from healthcare/medicines, electronics, textiles, agriculture, construction, water treatment, and food processing to cosmetics. Much of these applications are very much pertinent for a developing country like India. In this context, the government has been playing a pioneering role in fostering and promoting nanotechnology R&D in India since early 2000s. India is among the top 12 biotech destinations in the world and ranks third in the Asia Pacific. The development of nanotechnology in India has been mainly conceived and continued the premise that this new and emerging technology has huge potential to help the country address societal challenges such as provision of drinking water, healthcare, etc., and simultaneously achieve economic gains through growth in the nanotech-based industrial sector. Biotechnology and nanotechnology are among five key technologies that have the maximum potential to stimulate growth in Indian manufacturing and also serve national security priorities. Bio-nanotechnology is the key functional technology of the 21st century. It is a fusion of biology and nanotechnology based on the principles and chemical pathways of living organisms and refers to the functional applications of biomolecules in nanotechnology. It encompasses the study, creation, and illumination of the connections between structural molecular biology, nutrition and nanotechnology, since the development of techniques of nanotechnology might be guided by studying the structure and function of the natural nano-molecules found in living cells. Biology offers a window into the most sophisticated collection of functional nanostructures that exists.

STATE-OF-THE-BIO BASED PLASTICS INDUSTRY: OVERVIEW 2018

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While most major corporations around the world have escalated their efforts in recent years on improving the environmental impact and sustainability via several routes, some break-through concepts have only lately emerged. For example, converting land and forest wastes into chemicals; the latter besides numerous uses serve as building-blocks for plastics and reducing-capturing-converting the harmful greenhouse gases (CO_2 and CH_4) into chemicals. These revolutionary concepts are expected to take environment/sustainability efforts to new heights. This presentation will begin with a review of the historic emergence of the bio-based plastics industry starting with an era of waste management via biodegradation followed by a period of very high petroleum prices and proliferation of technology pipeline to develop traditional and new durable polymers, and now again through times of lower petroleum pricing/shale gas revolution. Despite turbulent events, reasons for steady-growth of this industry forecasted to be 34Blbs/year by 2020, will be highlighted. Emphasis of the presentation will be on how the field of polymers and chemicals is being rejuvenated via non-fossil raw-materials that are: biobased-sustainable or air-land-ocean pollutants; thereby leading to preservation of petroleum resources, reduction of air-land-ocean pollution, and utilization of free/undesirable raw materials.

Note: