Radiation Research and some 21st Century Challenges

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Radiations provide an excellent tool to conduct Chemistry, without adding chemicals and external catalysts. Challenges and the excitement of studying unique chemical transformations by blending High Energy Photon (energy ~ 1 Mev) with chemical compounds will be shared.

A few specific examples of the use of High Energy Photons to help in Societal benefits will be presented. Every major city collects large amounts of solid waste, which contains a large amount of pathogens. However, the solid waste could be an excellent source of bio-fertilizer as it contains many important and essential nutrients for fertilizer purpose. A success story of the use of High energy Photons to hygienize the sludge of a major city, Vadodara in India to give safe and clean bio-fertilizers will be discussed. In addition, it also provides clean recycled water for agricultural purposes.

Another example, where an understanding of basic Radiation Chemistry has given rise to useful and functionalized bio-polymers would be shared. The process of producing hydrogels having controlled pore structures led to the commercial production of radiation induced hydrogels for use in the cure of burns and healing of difficult wounds. Examples of a few other spinoffs from the basic research in Radiation Chemistry would be presented.