Multipurpose Gamma radiation system

Today, having access to the science and technology of radiation system in Iran is a necessity considering the increasing trend of population growth, demands in agriculture, medical equipment production, hygiene products as well as limitations confronted in available water and soil resources. Through deploying radiation technology, it is possible by using the available resources, to pave the way for provision of safe food and hygiene products for today as well as future generations. At present all industrial countries use sterilization systems through gamma and electron irradiation methods and currently around 200 gamma irradiation systems in the member countries of IAEO are active and functioning. In Iran, likewise, gamma irradiation system was established in 1985 to respond to the technology needs of that time.

The radiation application complex in northwest part of the country, in line with the objective of radiation application and research purposes, designed the first multipurpose gamma radiation system using the state of art technology in the world as well as domestic capabilities and prepared it for due operation.

- **Radiation applications**
  - Application in agriculture and food industries
  - Application in polymer industries, chemistry and environment
  - Application in industry, medicine and public health

Application in agriculture and food industries

-Prevention of damages and loss of high percentage of products and food stuff

-Preventing contamination of products, water and soil resources and environment

-Sterilization and reduction of pest carrying insects

-Destroying parasitic and destructive pathogens in fresh meat and proteins

-Inactivity or change(mutation) in enzymes in order to prolong shelf life span

- Reduction of fruit, mushroom and parasite contamination

- prolonging the shelf life of fruits and food stuff without the need for freezing and thus prevention of sprouting and rancidity

- Decontamination of different food stuff bacteria

Application in polymer industries, chemistry and environment

Modification of molecular structure and enhancing part of the thermal, physical or chemical properties of cheap polymer material

- Design, formulation and preparation of biodegradable polymers for protection of environment
- Replacement of catalysts with radiation to expedite reactions under any thermal or pressure conditions,
- Preparation and modification of composites and polymer radiation alloys.

- Improving polymer resistence against radiation
- Radiation bonding and networking of polymers radiations

Application in industry, medicine and public health

- sterilization of equipment and disposable medical items

-Radiating blood products and related instruments

- sterilization of various containers and food stuff packaging

- sterilization of hygienic – cosmetics products such as dental floss, ear cleaner and paper (facial) tissue

- elimination of pathogenic microorganisms in hospital thrash and waste

-recycling of plastic waste , Teflon….

-Preparing necessary ground for production of contractible thermal cables for different industrial use.

Research objectives

- Radiation application research and development in polymer, medical, agricultural, industrial and environmental industries,
- Development of radiation application in modification of plants through mutation,
- Design and making of gamma cells
- Design and building of portable radiating sites
- Offering consultation to the owners of industries concerning the choice and modification of polymer material resistant against radiation in product processing
- **The advantages of using multipurpose gamma radiation system**

- It is the fastest, safest and most comfortable procedure
- It quickly leaves desired effects and the products obtained are useable immediately
- There is no bad or negative effect on the radiated products or their consumers
- No preservatives are used in the radiated products
- The product upon final packaging is radiated
- The possibility of building centers for production of medical, hygiene products, food industries and processing of agricultural products are available beside the system.

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