

APPLICATIONS OF RADIATION PROCESSING IN VIETNAM

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I. Introduction

Radiation processing is studied so late, but developing fast in Vietnam. The first irradiator (gamma cell) with the initial loading capacity of 16.5 kCi has been operated since 1984 in Dalat, Vietnam. Many experimental studies were carried out on the irradiator with valuable results. Radiation sterilization, food irradiation, dosimetry, radiation modification of polymers have been investigated since 1983. The semi-industrial irradiator was installed in Hanoi with the initial loading capacity of 107 kCi. The initially designed purpose of the irradiator is food preservation (sprouting inhibition of potatoes and onions). As the unfitness of the irradiator design as well as its utilization purposes at present the irradiator should be upgraded for sterilization of medical products and food processing. A new period of application of radiation processing has been opened since an industrial irradiator project supported by IAEA in cooperation with Vietnamese Government has been put into operation in 1999 in Hochiminh city. The irradiator (source activity of 400kCi, in 1999) is in effective and safe operation for radiation sterilization of health care products, food irradiation and radiation-applied studies. A variety of locally produced products are irradiated on the irradiator for various purposes. Nowadays, Gamma irradiation gradually becomes popular in Vietnam. Electron beam facility used in radiation processing is not available yet, except some EB low energy accelerators installed in some hospitals for treatment.

II. Established research and development of radiation processing in Vietnam

1. Health care

No.	Purpose	Products	Scale
1	Radiation sterilization	Surgical glove, gauze, petridishes, test sticks, tissue graft.	Commercial
2	Radiation cross-linking	Wound dressing made from PVA and other additives	Trial production
3	Radiation vulcanization of natural rubber latex	Surgical gloves	Trial production

2. Agriculture

No.	Purpose	Products	Scale
1	Radiation degradation	Anti-fungus oligosaccharide from chitin/chitosan, Plant promoter from alginates	Trial production
2	Radiation pasteurization	Bagasse	Trial production
3	Graft copolymerization	Water super-absorbent for soil stabilizer, Biodegradable materials	In study

3. Environment

No.	Purpose	Products	Scale
1	Radiation degradation	Chitin/chitosan for heavy-metal ion adsorption	In study
2	Graft copolymerization	Ion-membrane	Already studied

4. Industry

No.	Purpose	Products	Scale
1	Radiation crosslinking	Shrinkable tubes	Already studies
2	Radiation crosslinking	PE foam, tires	Not yet developed

5. Food irradiation

No.	Purpose	Products	Scale
1	Radicidation	Dried fish, spices, traditional drugs, Frozen frog legs, etc.	Commercial
2	Sprout inhibition	Potatoes, onions	Trial production

The throughput of the irradiator in Hochiminh city is presented in the Fig. 1

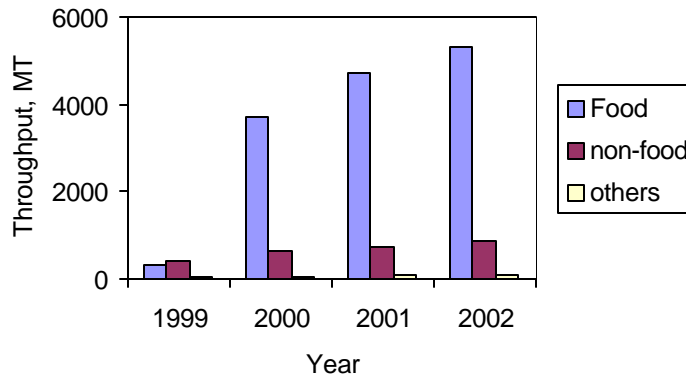
III. Future research and development

- The irradiator in Hanoi will be upgraded
- The second irradiator will be installed in Hochiminh city
- A low energy EB accelerator is expected to be installed in Hochiminh city in the period of 2003-2005 for demonstrations of research experiments.

IV. Outline of low energy EB machine project

Title of the project	Implementation duration	Institution	Project objectives	Specifications of EB machine	Scope of project	Project schedule
Low energy EB accelerator for R&D in Vietnam	2002-2005	VINAGAMMA, Hochiminh city, Vietnam	Research and development of the most feasible EB applications for the following investment of commercial EB machine	Voltage:300kV Current:10-30mA Self-shielding type	Research and development of specified products of solid in film form and liquid	2002-2003: Finance settlement 2003-2004: in operation 2004-2005: Demonstration

Figure 1. Annual treated throughput of gamma irradiator in HCMC



V. Conclusion

- It is expected that the FNCA-2002 workshop will be useful for getting some necessary information on cost analysis of low energy EB machine investment.
- In addition to the expected significance of study using the EB facility, we are looking forward to effectively using the accelerator for insight-applied processes of radiation processing.

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