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Radiation Processing for Cultural Heritage Preservation –Romanian Experience

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Radiation sterilization was taken into consideration as mass decontamination techniques for the bio-degradable cultural heritage (CH) as soon it was spread in the medical field. Earlier experiments showed the advantages and disadvantages, namely “side-effects” on the CH materials. More than 50 years later, the suitability of ionizing radiation treatment for CH items is still under debate. The main reason is that the science and industry were not able to provide yet another mass decontamination technique with higher efficiency and effectiveness.

For wood items there is a general agreement that the irradiation dose needed for insect eradication will not produce any damage, even in case of painted wood. For cellulose in paper there is a reduction of the degree of polymerization (DP) at higher doses required for stopping the fungal attack but this should be taken into consideration against the purpose of the treatment. Emergency or salvage treatments are required for mitigation of consequences of accidents or bad storage conditions. In some cases (archives) the value of the written information is higher than the historical value of paper artifact. For other materials (textiles, leather, parchment) there are less published investigations on the effects of ionizing radiation. As a general rule, irradiation is not needed when there are a few CH items affected by biological contamination. The conservators and restaurateurs can handle the problem by classical means. The need for irradiation appears when there are large collections (hundreds, thousands or more items) heavily affected by biological attack.

Following new literature reports there is a slow increase in the quantities and kinds of irradiated CH items in different countries of the world. In Romania, IRASM gamma irradiator of IFIN-HH is receiving an increasing number of requests for CH irradiation, mainly because an intensive research program on this topic and a close contact with the CH owners or administrators. After more than 10 years of CH irradiation, IRASM facility can advise the CH owners about choosing the irradiation dose and how to evaluate the irradiation side effects (if any). Beside the review of the scientific results obtained in Romania and abroad, this paper is presenting some examples from Romanian experience.

Country/Organization invited to participate

Romania

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