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Application of Ionizing Radiation for the Decontamination of Glass Photographic Negatives: A Study on the Preservation of Cultural Heritage

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The preservation of glass photographic negatives, a critical component of 19th and 20th-century visual heritage, poses unique challenges due to their susceptibility to deterioration caused by biological contaminants such as fungi. This study explores the application of ionizing radiation as an effective method for decontaminating glass negatives, building on previous research conducted on the decontamination of flexible acetate-based negatives.

The research investigates the effects of ionizing radiation on the structural integrity and image quality of glass negatives, aiming to assess its viability as a conservation tool. A series of controlled irradiation experiments were conducted, followed by detailed analysis using techniques such as colorimetry and UV-vis spectrophotometry to measure any changes in the visual and chemical properties of the negatives.

The results indicate that ionizing radiation, when applied under specific parameters, can successfully reduce microbial contamination without causing significant alterations to the glass substrate or the photographic emulsion. However, the study also highlights the need for careful calibration of radiation doses to avoid potential side effects, such as changes in color or loss of detail in the image.

This paper contributes to the growing body of knowledge on the use of radiation technologies for the conservation of photographic materials, offering insights into the development of new methodologies for the preservation of glass negatives. The findings have significant implications for cultural institutions seeking sustainable and non-invasive conservation strategies for their photographic collections.

This research provides a critical foundation for future studies, particularly in refining the application of ionizing radiation in diverse types of photographic media, further expanding the toolkit available to conservation professionals.