

Optical Brighteners: History and Technology

ABSTRACT

In the early twentieth century a class of chemicals was identified that could increase whitening by the action of fluorescence. These materials, often called colorless dyes, are known as fluorescent whitening agents, optical bleaches, or optical brighteners. Optical brighteners are a group of molecules that absorb light predominantly in the ultraviolet range and emit light in the visible range, thereby causing a brightening of the substrate by emitting more than one hundred percent of the incident visible light. These materials were first used in food packaging and x-ray film enclosures to prevent deterioration caused by ultraviolet light. Soon their whitening properties were exploited, and brighteners were added to numerous commercial materials, fostering a taste for “whiter than white” papers and textiles and non-yellowing plastics. In the conservation and preservation of works of art and cultural property, the behavior and aging of optical brighteners play an important role, particularly in works from the second half of the twentieth century. The technology and development of these materials and their chemistry affects their longevity, appearance, and interaction with conservation procedures.

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REFERENCE

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