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Optical Brightener Loss in Photographic Paper

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Abstract

Optical brightener use in photographic paper production began in the mid-1950s. These brighteners are dyes that produce fluorescent emission in the blue region of the visible spectrum, thereby creating a whiter and brighter paper. Even though optical brighteners are now prevalent in photographic papers, little is known about their sensitivity to light exposure, the appearance of photographic paper after optical brightener loss or the impact these changes will have on the conservation of photographs.

For this reason, forty-three black-and-white photographic print papers, representing nine manufacturers and ranging in date from 1956 to 2004, were studied to evaluate the contribution to appearance and the light sensitivity of their optical brighteners. Colorimetric measurements showed that the brighteners account for as much as one-fifth of the total reflectance in the blue region of the spectrum. Exposure of these samples to simulated daylight during accelerated aging tests showed a decrease in fluorescent emission, thereby reducing the optical brighteners’ contribution to overall appearance of the paper. The rate of optical brightener loss was relatively slow, with the majority of samples retaining at least half of their original fluorescent appearance after completion of accelerated aging tests. The implications of optical brightener appearance and sensitivity for treatment and exhibition of brightened photographs will also be discussed.

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