Article: Removing Residual Iron from Platinum and Palladium Prints (Abstract)
Author(s): Matthew L. Clarke and Dana C. Hemmenway
Topics in Photographic Preservation, Volume 16.
Pages: 295
Compiler: Jessica Keister


Topics in Photographic Preservation is published biannually by the Photographic Materials Group (PMG) of the American Institute for Conservation (AIC). A membership benefit of the Photographic Materials Group, Topics in Photographic Preservation is primarily comprised of papers presented at PMG meetings and is intended to inform and educate conservation-related disciplines.

Papers presented in Topics in Photographic Preservation, Vol. 16, have not undergone a formal process of peer review. Responsibility for the methods and materials described herein rests solely with the authors, whose articles should not be considered official statements of the PMG or the AIC. The PMG is an approved division of the AIC but does not necessarily represent the AIC policy or opinions.
Removing Residual Iron from Platinum and Palladium Prints

Matthew L. Clarke and Dana C. Hemmenway

Presented at the PMG session of the 2015 AIC Annual Meeting in Miami, Florida.

The long-term stability of a photograph can be affected by the original processing conditions. Undesired residual chemicals can have lasting impacts not readily discernible immediately after printing. For example, the iron-mediated platinum and palladium printing processes require the clearing of iron after development. Many factors can change the final residual iron content, such as the chemical nature of the clearing bath (e.g., solutions containing hydrochloric acid, sodium citrate, or chelators), the clearing time, and the number of clearing and washing baths employed. Photographers need to balance these conditions in their workflow, and use visual means to assess the quality of the print. However, the appearance of a print can be influenced by small amounts of residual iron, and these effects may become increasingly visible over time. A detailed investigation of platinum and palladium printing conditions demonstrate that a reduction in clearing time or changes in the nature of the clearing bath can lead to prints that appear satisfactory immediately after printing yet exhibit a sensitizer stain after accelerated aging. Just as there are many ways to remove iron from a print during the original processing, there are also numerous options for treatment of prints exhibiting sensitizer stains. Several chelators (EDTA, DTPA, HBED) were investigated in their ability to minimize visible staining and to reduce iron in the print. Chelation baths varied in the concentration, chelation time, and the addition of sodium dithionite. Each variable changed both the immediate and long-term appearance of the print (as determined by accelerated aging). In addition to monitoring the reduction in iron, changes in the amount of other elements present either as part of the printing process (e.g., mercury) or the paper substrate (e.g., calcium) were examined. This in-depth study of printing variables and studies on the effectiveness of conservation treatments will inform the community on the care and preservation of platinum and palladium prints.

Matthew L. Clarke
Photographic Materials Scientist
National Gallery of Art

Dana C. Hemmenway
Senior Photograph Conservator
Library of Congress