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Article: Removing Residual Iron from Platinum and Palladium Prints (Abstract)

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# Removing Residual Iron from Platinum and Palladium Prints

**Matthew L. Clarke and Dana C. Hemmenway**

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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.

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