Calcium Phytate Treatment on 19th Century Iron Gall Ink Documents: Overall Summary of Research Results and Implications on Treatment Decisions

ABSTRACT

The effectiveness of calcium phytate in protecting works on paper containing iron gall ink has consistently been demonstrated since its first introduction by Neevel in 1995. In July 2007, an optimal procedure was published by the Netherlands Institute for Cultural Heritage (ICN), with details, among other topics, about the pros and cons of the treatment. Nonetheless there are still reservation and discussions about if and when this treatment should be used. In 2002, nine original iron gall ink documents, typically found in Canadian Archives, were subjected to 18 separate aqueous treatments comparing the standard calcium phytatecalcium bicarbonate (Ca-phy $Ca(HCO_3)_2$) treatment to deacidification with $Ca(HCO_3)_2$ and magnesium bicarbonate ($Mg(HCO_3)_2$), paper simmering, and other modified phytate treatments. Five sets of these treated samples were further subjected to exposure to heat and humidity (80°C, 65%RH, 8 weeks), high intensity light (3.71Mlux-hr, 14–40W Vitalite fluorescent tubes, no UV filter), and elevated humidity at room temperature (85%RH, 22°C, 22 weeks). Changes were evaluated against unaged or untreated controls. Methods of evaluation include hyperspectral imaging, colour measurement, pH, bathophenthroline test and microfade testing. Results from this study have previously been reported in part in different venues as they became available. This paper will present a summary and overview of all the results, including those from microfade testing, and will present the key conclusions from this study that will help conservators make decisions about when phytate is most beneficial.

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