The Chemistry of the War Time Admiral

A spectroscopic study of the red 2¢ Admiral Issue of Canada
and
The identification of a WW I shade solely defined by its spectroscopy

This paste-up coil was produced around May 11, 1915 during the First World War. Most viewers of this stamp will see two distinct shades. But getting philatelists to agree on the names of these two shades has always been a problem. Even with color guides, most collectors would have trouble matching shades to names. This study will address this problem by using three spectroscopic techniques to show that these changes in shade have occurred due to changes in ink chemistry. Furthermore, it will show that a broad grouping of shades can be done from its spectroscopy alone. An aniline pink shade will be shown to have a unique spectroscopic signature.

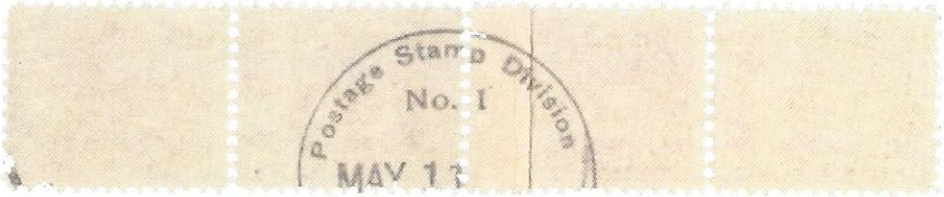

Image of the Gum Side of the Past-Up Coil (x 1.25)

Organization and Objectives

Section 1: Pages 2-4. Reflectance Spectroscopy: Examples from the entire Admiral series are used to illustrate this type of spectroscopy. Next, the continuum of shades of the 2¢ red carmine are shown to be partitioned into two major groupings based on spectra. Finally, through plate blocks, the dating of the shade transitions is shown.

Section 2: Pages 5-8. X-Ray Fluorescence (XRF) and Fourier Transform Infra Red spectroscopy (FTIR): These are used to show the changes in the ink chemistry that caused the changes in shade. Elements present in the ink are identified by XRF while chemical compounds in the paper and ink are found using FTIR. The major changes in ink chemistry occurred during WW I.

Section 3: Pages 9-12. A Flow Diagram and the 'Aniline Ink' Variety: The section details the steps in the production of a quality printing ink at the turn of the 20th century. It identifies the location at which the various compounds enter into the ink making process. It pinpoints the likely reason for a production flaw that causes a serious bleed through of the ink to the gum side ('aniline ink').

Section 4: Pages 13-16. The 'Aniline Ink Pink' Shade: Five expertized stamps certified as pink have a chemistry that is pre WWI and very similar to certified rose carmine stamps. Two other certified pink stamps are part of a group of only 2.3% of the 468 in this study. This group has unique features in both their reflectance spectra and chemistry. This group is called the 'aniline pink' shade as detailed in this section.