Collection Care Solutions for Plastics in Library and Archival Collections — An Update

Chantal Stein, Jessica Pace

INTRODUCTION

Background:

This poster presents the next step in a continuing project at NYU Libraries to identify and rehouse plastic items in the David Wojnarowicz Papers (MSS 092). The first step in the project was presented in a poster at the 2019 American Institute for Conservation Annual Meeting.

The Plastics Project – Research to Date:

The first phase of this project involved conducting FTIR analysis to identify a small portion of the collection, compiling resources for plastics identification, and investigating reduced oxygen and ventilated housing. In this second phase, we evaluated identification methods, identified all plastic objects in the David Wojnarowicz Papers, and devised housing strategies for all plastic types that were found.

IDENTIFICATION

Various plastic types follow different degradation pathways, so it's crucial to first identify plastic polymers before determining storage solutions.

Identification methods:

- Optical and physical properties
  - Pros: readily available online tools to guide examination
  - Cons: time consuming, requires expertise, some tests are risky to collection items or to human health, ambiguous, subjective
- Microchemical spot tests
  - Pros: definitive answers, small samples, can ID malignant plastics, affordable
  - Cons: tests only exist for certain polymers, requires lab space and staff trained in lab safety procedures
- Fourier Transform Infrared Spectroscopy (FTIR)
  - Pros: fast and easy to use, little to no sampling, can ID broad range of plastics and other components definitively
  - Cons: expensive equipment, operator expertise

Authors

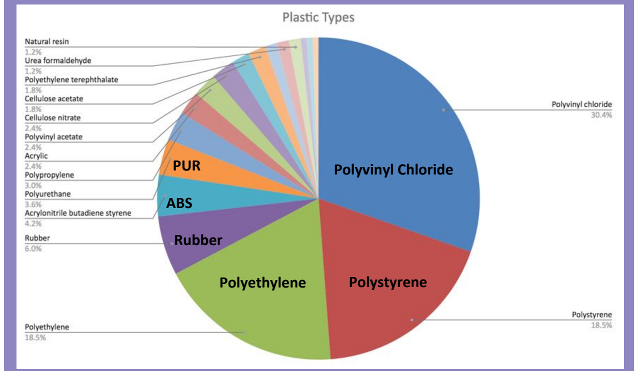
Chantal Stein is an assistant conservator in Objects Conservation at the Metropolitan Museum of Art. She received her dual MS/MA in Conservation and Art History from the Conservation Center of the Institute of Fine Arts, NYU, and her BA from Columbia University.

Jessica Pace is the preventive conservator at New York University Libraries. She received her MA in Art History and Certificate of Advanced Study in Conservation from the Conservation Center of the Institute of Fine Arts, NYU, and her BA from Barnard College. She is a Professional Associate member of AIC.

IDENTIFICATION CONTINUED

FTIR results:

100+ plastic objects from the Wojnarowicz Papers were analyzed using FTIR analysis to determine polymers in the collection.



After analysis, plastic objects were separated into two categories: benign and malignant.

HOUSING: BENIGN PLASTICS

Benign plastics are relatively stable and do not harm surrounding materials as they degrade.

Most benign plastics can be stored in standard materials like archival boxes, Volara® and/or Ethafoam®, and acid-free tissue. PTFE and glass are also safe.

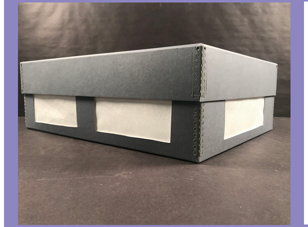
A barrier layer of silicone-coated Mylar® placed between objects and storage materials can prevent leached plasticizer from sticking.

HOUSING: MALIGNANT PLASTICS

However, traditional storage materials and methods are not recommended for all plastics, and may actually be detrimental to certain polymers. The malignant plastics are particularly tricky because they all degrade differently and need to be housed according to polymer-specific requirements and recommendations.

HOUSING: MALIGNANT PLASTICS CONT'D

Cellulose nitrate (CN) and cellulose acetate (CA):



CN and CA both off-gas acidic compounds as they degrade. They can be stored with sorbents, in cold storage, or in vented environments. Vented boxes can be created by cutting windows and replacing them with Reemay® or a similar lightweight spunbonded polyester fabric.

Polyvinyl chloride (PVC):

PVC degrades primarily by plasticizer loss. It is best to store PVC in non-adsorbent sealed containers. For example, heat-sealed envelopes made of Mylar® film are transparent and easy to create. An interleaving of silicone-coated Mylar® film prevents plasticizer from sticking.

Rubber and polyurethane (PUR):

Both rubber and PUR degrade by oxidation and therefore benefit from anoxic environments. Enclosures can be created with Escal™ oxygen barrier film and oxygen scavengers. PUR also degrades by hydrolysis and should be stored at 20-30% RH.

CONCLUSIONS

This project has shown that it is possible to produce scalable and cost-effective solutions for various plastics in high use collections and academic research libraries. We will next test these housing solutions on plastics in other collections, including ones with different methods of archival arrangement.

ACKNOWLEDGMENTS

We would like to acknowledge the Lenape people on whose traditional lands NYU resides and the Wojnarowicz Papers is housed.

Thanks to Laura McCann, Nicholas Martin, Joy Bloser, Lia Kramer, and Taylor Healy. Thanks to FAIC and the Samuel H. Kress Foundation.