workshops for conservators.

Projects should begin no earlier than November 1 for full consideration. Applications and supporting documents, including any required letters of support must be delivered to the AIC office (no faxes, please) by September 15. Electronic submissions of applications are encouraged; see grant guidelines for forms and details. Letters of support can be sent by mail or e-mail, but must include a signature.

For more information, contact Eric Pourchot in the AIC office at epourchot@aic-faic.org or (202) 452-9545, ext. 5.

Annual Meeting

Call for General Session Papers 2009

The 2009 Annual Meeting theme is *Conservation 2.0—New Directions*. This program will highlight the ways in which emerging technologies will affect the conservation field. Papers outlining and showcasing recent advances in all specialties addressing scientific analysis, treatment method and material improvements, and documentation are welcome. Presentations focused on improving environmental practices for all aspects of conservation and business practices are also invited.

Papers for the 2009 Annual Meeting should be tailored to a 20- to 30-minute presentation time frame. To submit one for consideration, please send an abstract of no more than 500 words to Ruth Seyler, Membership and Meetings Director, rseyler@aic-faic.org by Aug. 20, 2008

Submissions will be reviewed by the Program Committee, which currently consists of Meg Craft, Margaret Little, and Rebecca Rushfield. Anyone interested in joining the committee should contact Meg Craft at mcraft@thewalters.org. Please volunteer now to join in the development of the 2009 general session.

Call for Annual Meeting Workshop Proposals

Proposals for workshops to be held in conjunction with the 2009 AIC Annual Meeting are due by October 1. The workshop date is Tuesday, May 19, 2009. Sessions will be held at the Hyatt Regency Century Plaza Hotel in Los Angeles, California.

Some topics that have been requested by members that might lend themselves to one-day or half-day sessions in a hotel environment include:

- Documentation (various aspects)
- Material science (various materials)
- Analytical instruments
- Suction table techniques
- Laboratory design
- Pest management
- Exhibit mounts (including seismic)
- Collections management
- Identification techniques (various – woods, printing techniques, etc.)
- Storage
- Packing, transit
- Evaluation of previous conservation treatments
- Working with special materials, such as wax or feathers

Individuals or groups considering organizing a workshop are encouraged to contact Eric Pourchot, AIC Professional Development Director, early in the process for assistance with planning and budgeting, at (202) 452-9545, ext. 5 or epourchot@aic-faic.org. Proposal forms are available on the AIC website.

Health and Safety

Some Chemical Things Considered: Bisphenol A

Characteristics [1 & 2]
Chemical formula: C15H16O2
CAS#: 80-05-7
Molecular wt.: 228.29
Boling Point °C: 220
Melting Point °C: 150-155
Vapor Pressure: 3.91X10-7 mm. Hg, 25°C
Synonyms: BPA, Bisphenol, 4,4'-(1-Methylethylidene)bisphenol, 4,4'-Isopropylidenediphenol

Introduction

Bisphenol A (BPA) is a monomer with two phenol functional groups. It consists of white to light brown flakes, crystals or powder. It is soluble in acetic acid, aqueous alkaline solutions, acetone, and slightly soluble in carbon tetrachloride. BPA was first synthesized in 1891. In the 1930s BPA was determined to be an artificial estrogen and in 1953 it was first used to synthesize polycarbonate. [3]

BPA has been used as an intermediary or building block for several polymers including polycarbonates, epoxy resins, as well as phenoxy, polysulfone and certain polyester resins; flame retardants and rubber chemicals; and to formulate fungicides. Today BPA containing materials may be found in coatings on cans for foods and beverages, in dental sealants, dental retainers, syringes, eyeglass lenses, plastic beverage, food and laboratory containers as well as in epoxy resins and putties used in the field of conservation.

Until recently, BPA was not considered a toxic chemical. However, BPA's role as an endocrine disruptor that functions as an estrogen mimic has been known for some time. These mimics trigger the receptors for estrogen in both male and female mammals. Chris Stavroudis's articles on BPA and other xenoestrogens in the *WAAC Newsletter* provide excellent context and discussion of BPA's effects. [4] Here is one of his helpful summaries:

Table 1: Resin Identification Codes	
1 PET	PETE: Polyethylene terephthalate ethylene. Examples: soft drink, juice, water, detergent, peanut butter containers.
2 PE-HD	HDPE: High density polyethylene. Examples: opaque plastic milk and water jugs, bleach, detergent and shampoo bottles and some plastic bags.
4 PE-LD	LDPE: Low density polyethylene. Examples: grocery store bags, most plastic wraps and some bottles.
3 PVC	PVC or V: Polyvinyl chloride. Examples: cling wrap, some plastic squeeze bottles, detergent, and window cleaner bottles.
5 PP	PP: Polypropylene. Examples: most Rubbermaid, deli soup, syrup and yogurt containers, straws, and other clouded plastic containers, including some baby bottles.
6 PS	PS: Polystyrene Examples: Styrofoam food trays, egg cartons, disposable cups and bowls, carryout containers, and opaque plastic cutlery.
7 OTHER	Other: Usually polycarbonate, also acrylonitrile butadiene styrene acrylic, polyactic acid, nylon and fiberglass. Polycarbonate used in most plastic baby bottles, 5-gallon water bottles, "sport" water bottles, metal food can liners, clear plastic "sippy" cups, and some clear plastic cutlery.

As is often the case with xenoestrogens, the discovery of BPA's interference with chromosome alignment was accidental. In 1998, researchers in three different labs at Case Western Reserve University found a sudden increase in chromosomal abnormalities in the mouse eggs they were studying. Initially, they suspected a genetic mutation was the cause. Instead, they found that a worker had cleaned the mouse cages and water bottles with a too-harsh detergent. The alkaline detergent caused sufficient quantities of BPA to leach out of the plastic to cause eight times the aneuploidy and 20 times the errors in chromosomal alignment in the mouse eggs." [4]

Controversy over the safety of BPA has recently arisen again with the release of a risk review report by the National Toxicology Program on April 14th and the announcement on April 19th by Canada Health that BPA would be banned in that country. [5 & 6] BPA is of concern to the general population because of its presence in polycarbonate plastics, which are commonly used for beverage and food containers and dishware, including baby bottles and children's sipping cups, in the resins used to line food containing cans, and in dental composites and coatings. It is of concern to conservators specifically due to its presence in epoxy resins and epoxy putties, where there are exposure risks from inhalation and skin absorption. Precautions to prevent skin contact and inhalation hazards should be considered when working with these materials.

Hazards

Bisphenol A has recently undergone extensive analysis for exposure risk assessment. Nevertheless, to date there are no NIOSH, OSHA, ACGIH or IDLH exposure limits established for this chemical. According to the recently published Canada Health screening assessment summary:

> Dietary intake is the primary source of exposure. Exposure estimates for the general population of Canada range from 0.08 Ìg/kg body weight (bw) per day to 4.30 Ìg/kg-bw per day. Specific exposure estimates for the most highly exposed subpopulation (i.e., infants) range from an average of 0.50 Ìg/kg-bw per day (maximum 4.30 Ìg/kg-bw per day) for infants aged 0 to 1 month to an average of 0.27 Ìg/kg-bw per day (maximum 1.75 Ìg/kg-bw per day) for infants aged 12 to 18 months. A critical effect for characterization of risk to human health is reproductive and developmental toxicity. The neurodevelopmental and behavioral dataset in rodents, though highly uncertain, is suggestive of potential effects at doses of the same order of magnitude to one to two orders of magnitude higher than exposures. Given that toxicokinetic and metabolism data indicate potential sensitivity to the pregnant woman/fetus and infant, and that animal studies suggest a trend towards heightened susceptibility during stages of development in rodents, it is considered appropriate to apply a precautionary approach when characterizing risk. As such, it is proposed that bisphenol A be considered as a substance that may be entering the environment in a quantity or concentration or under conditions that constitute or may constitute a danger in Canada to human life or health. [5]

The following excerpts are taken from the concluding summary of the NTP Draft Brief on BPA [8]. The data following that are gathered from the NIOSH International Score Card and two MSDS's from two different manufacturers of BPA.

> The National Toxicology Program (NTP) concurs with the conclusion of the Center for the Evaluation of Risks to Human Reproduction (CERHR) Expert Panel on Bisphenol A that there is ***some concern*** for neural and behavioral effects in fetuses, infants, and children at current human exposures. The NTP also has ***some concern for*** bisphenol A exposure in these populations based on effects in the prostate gland, mammary gland, and an earlier age for puberty in

females.

The NTP has ***negligible concern*** that exposure of pregnant women to bisphenol A will result in fetal or neonatal mortality, birth defects, or reduced birth weight and growth in their offspring.

In laboratory animals, exposure to very high levels of bisphenol A during pregnancy can cause fetal death and reduced birth weight and growth during infancy. These studies provide clear evidence for adverse effects on development, but occur at exposure levels far in excess of those experienced by humans. Two recent human studies have not associated bisphenol A exposure in pregnant women with decreased birth weight or several other measures of birth outcome. Results from several animal studies provide evidence that bisphenol A does not cause birth defects such as cleft palette, skeletal malformations, or grossly abnormal organs.

The NTP concurs with the conclusion of the CERHR Expert Panel on Bisphenol A that there is ***negligible concern*** that exposure to bisphenol A causes reproductive effects in non-occupationally exposed adults and ***minimal concern*** for workers exposed to higher levels in occupational settings.

Data from studies in humans are not sufficient to determine if bisphenol A adversely affects reproduction when exposure occurs during adulthood. A number of studies, when considered together, suggest a possible effect on reproductive hormones, especially in men exposed to higher levels of bisphenol A in the workplace. Laboratory studies in adult animals show adverse effects on fertility, estrous cycling, and the testes at exposure levels far in excess of those experienced by humans. A number of other effects, such as decreased sperm counts, are reported for the reproductive system at lower doses in animals exposed only during adulthood, but these effects have not been shown to be reproducible.

Exposure routes: Inhalation, dermal absorption, ingestion. The primary concern for conservators will be inhalation and skin exposure from working with BPA containing adhesives in resin and putty forms. Ingestion is a broader concern with the consumption of foods and beverages stored in containers made of or coated with BPA plastics where there can be chemical migration.

Target organs and systems: eyes, skin, respiratory system, [9] liver, bone marrow. [11]

Acute Symptoms: Short-term exposures can result in irritation to the eyes, the skin and the respiratory tract with associated redness and soreness of eyes and skin, sore throat, coughing and nausea. Repeated or prolonged contact may cause skin sensitization. [9]

Exposure Limits:
LD50(oral rat): 4040 mg/kg [11]
LD50(oral rat): 3250 mg/kg [12]

Reports of Carcinogenicity:
NTP: No IARC: No OSHA: No [10]

Personal Protection: Wear personal protective clothing, gloves and goggles.

For inhalation: prevent unnecessary inhalation of dust by using respirator, fume hoods or other appropriate forms of ventilation.

For eyes: prevent exposure by wearing protective eyewear such as goggles

For ingestion: do not drink, eat, or smoke while working with BPA containing materials.

SPI Resin Identification Code [12 & 13]

Table 1 presents the Society of Plastics Industry (SPI) codes, which may be found on the bottom of most plastic containers. Examples of

FURTHER READING & REFERENCES:

Bisphenol A: A Known Endocrine Disruptor, A WWF European Toxics Programme Report, April 2000. http://www.wwf.org.uk/filelibrary/pdf/bpa.pdf

Bisphenol A website (Sponsored by the Polycarbonate/BPA Global Group, which is organized regionally at the American Chemistry Council, PlasticsEurope, and the Japan Chemical Industry Association). http://www.bisphenol-a.org/

Nalgene, Nalgene and Bisphenol A website. http://www.nalgene-outdoor.com/technical/bpaInfo.html

Stavroudis, Chris. 1996. Out with the Old, In with the New. WAAC Newsletter. 18:1. http://palimpsest.stanford.edu/waac/wn/wn18/wn18-1/wn18-105.html

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National Toxicology Program, Department of Health and Human Services, Center for the Evaluation of Risks to Human Reproduction. Bisphenol A. http://cerhr.niehs.nih.gov/chemicals/bisphenol/bisphenol.html

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Government of Canada. Chemical Substances, An ecoAction Initiative. April 14, 2008. *Bisphenol A Fact Sheet*. http://www.chemicalsubstanceschimiques.gc.ca/challenge-defi/bisphenol-a_fs-fr_e.html

The Green Guide: Bisphenol A. http://www.thegreenguide.com/doc/114/bpa

Lyndsey Layton and Christopher Lee. 2008. Canada Bans BPA From Baby Bottles. *The Washington Post*. Saturday, April 19, 2008; A03. http://www.washingtonpost.com/wpdyn/content/article/2008/04/18/AR2008041803036_pf.html

MSDS for BPA containing EPO-TEK 301 epoxy resin (pdf). http://www.epotek.com/SSCDocs/MSDS/301_msds.PDF

Bisphenol A, epichlorohydrin polymer, *CAS#*: 25068-38-6. http://hpd.nlm.nih.gov/cgi-bin/household/brands?tbl=chem&id=2382

typical containers made of the different types of plastics are also provided.

Bisphenol A is found in polycarbonates, which are included in group #7. Plastics in groups #3 and #6 also ought to be avoided out of general health and safety concerns.

Sources:

[1] National Library of Medicine, Hazardous Substances Data Bank, Toxnet. http://toxnet.nlm.nih.gov/cgi-bin/sis/search/r?dbs+hsdb:@term+@rn+@rel+80-05-7

[2] The Merck Index. Thirteenth Edition. 2001. "Bisphenol A" Whitehouse Station, NJ: Merck & Co, Inc. p.1294

[3] Anon. Sunday, April 27, 2008; A10 117 Years of BPA. Washington Post. http://www.washingtonpost.com/wp-dyn/content/article/2008/04/26/AR2008042602038_pf.html

[4] Stavroudis, Chris. 2003. Health and Safety. *WAAC Newsletter.* 25(2):10-11

[5] Canada Gazette. April 19, 2008. *Publication after screening assessment of a substance—Phenol, 4,4' -(1-methylethylidene)bis- (bisphenol A), CAS No. 80-05-7* — Specified on the Domestic Substances List *[subsection 77(1) of the* Canadian Environmental Protection Act, 1999*]* Part I Vol 142, No. 16. p. 1108. http://canadagazette.gc.ca/partI/2008/20080419/pdf/g1-14216.pdf

[6] NTP Brief on *Bisphenol A*, April 14, 2008. http://cerhr.niehs.nih.gov/chemicals/bisphenol/BPADraftBriefVF_04_14_08.pdf

[7] Government of Canada. Chemical Substances, An ecoAction Initiative. April 14, 2008. *Government of Canada Takes Action on Another Chemical of Concern: Bisphenol A.* http://www.chemicalsubstanceschimiques.gc.ca/challenge-defi/bisphenol-a_e.html

[8] NIEHS (National Institute of Envrionmental Health Sciences). 2008. *Questions and Answers about the Draft National Toxicology Program Brief on Bisphenol A.* http://www.niehs.nih.gov/news/media/questions/sya-bpa.cfm#2

[9] *International Chemical Safety Card, Bisphenol A.* http://www2.siri.org/msds/mf/cards/file/0634.html

[10] General Electric Company. 1996. MSDS. Bisphenol A. http://www2.siri.org/msds/f2/cgr/cgrwy.html

[11] Sigma-Aldrich. 2004. MSDS. Bisphenol A 99%+. http://www.glue.umd.edu/~choi/MSDS/Sigma-Aldrich/BISPHENOL%20A.pdf

[12] Institute for Agriculture and Trade Policy. 2008. Smart Plastics Guide: Healthier Food Uses of Plastics. http://www.iatp.org/iatp/publications.cfm?accountID=421&refID=77083

[13] SPI Material Container Coding System. http://www.plasticsindustry.org/outreach/recycling/resincodes.htm

—Marilen Pool, Objects Conservator, AIC Health & Safety Committee

People

Textile Preservation Associates Inc. has moved. The new address is: Textile Preservation Associates Inc., P. O. Box 206, Ranson, WV 25438, (304) 724-1861.

The **Winterthur/University of Delaware Program in Art Conservation** proudly announces the students admitted into the 2008 entering class: LeeAnn Barnes, Lauren Bradley, Alisha Chipman, Rose Daly, Amanda Maloney, Gwen Manthey, Emily MacDonald-Korth, Caroline Roberts, Kirsten Travers, Renee Wolcott

The program's third year students and their internship sites are: Lisa Duncan, Heugh-Edmondson Conservation Services and Weissman Preservation Center, Harvard University (photographs); Louise Groll, The Walters Art Museum (paintings); Bret Headley, Philadelphia Museum of Art (furniture); Jessica Keister, National Gallery of Canada and the Canadian Conservation Institute (photographs); Meghan McFarlane, Arizona State Museum (objects); Lauren McMullen, The Walters Art Museum (objects); Sharon Norquest, Alexandria Conservation Services, Ltd. and Virginia Museum of Fine Arts (objects); Cynthia Schwarz, Yale University Art Gallery (paintings); Kate Wight, Metropolitan Museum of Art and the British Museum (objects).

The **Conservation Center of the Institute of Fine Arts, New York University** is pleased to announce the incoming students for the graduating class of 2012: Sara Bellis, Linsly Boyer, Justine Ellis, Jessica Lian, Kristin Patterson, Kristin Robinson, Julia Sybalsky, Kristen Watson

The program's third year students and their internship sites are: Jennifer Badger, Fine Arts Museums of San Francisco (paper); Aimée Ducey, Museum für Moderne (objects); Tara Hornung, Diana Johnson, Philadelphia Museum of Art (objects); Katie Patton, Fine Arts Museums of San Francisco (paintings); Anna Serotta, Brooklyn Museum (objects).

University of Texis, Austin is pleased to announce its incoming students: Alexander Bero, David Berson, Kathryn Blackburn, Jennifer Evers, Evan Knight, Youm In Kyung, Jill Sison.

The program's third year students, and their internship sites are: Danielle Fraser, Library of Congress; Suzy Morgan, Northwestern University Library; Sarah Norris, Newberry Library; Emily Rainwater, Smithsonian Institution Libraries; Melissa Tedone, University of Illinois at Urbana-Champaign Library.

The Art Conservation Department, Buffalo State College is pleased to announce the incoming students for the fall of 2008: Fran Baas, Gregory Bailey, Mary Broadway, Beatriz Centeno, Gabriel Dunn, Emily Hamilton, Kari Kipper, Sarah Nevole, Elizabeth Saetta, Erin