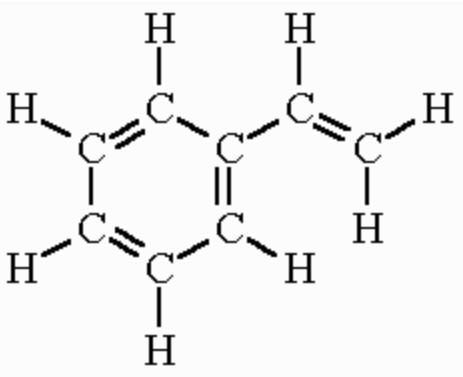
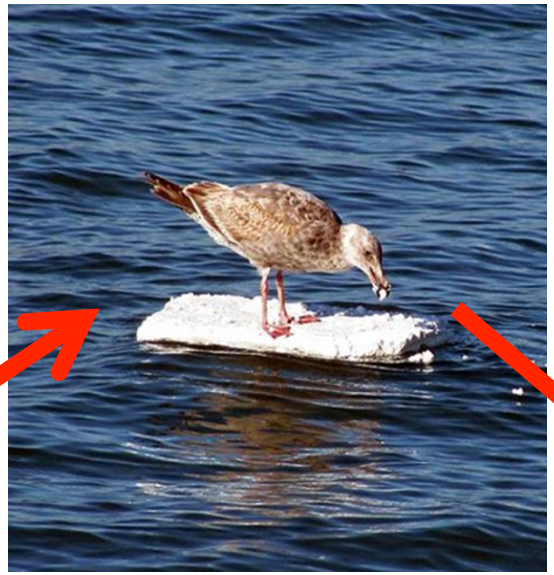

The Problem with Styrofoam

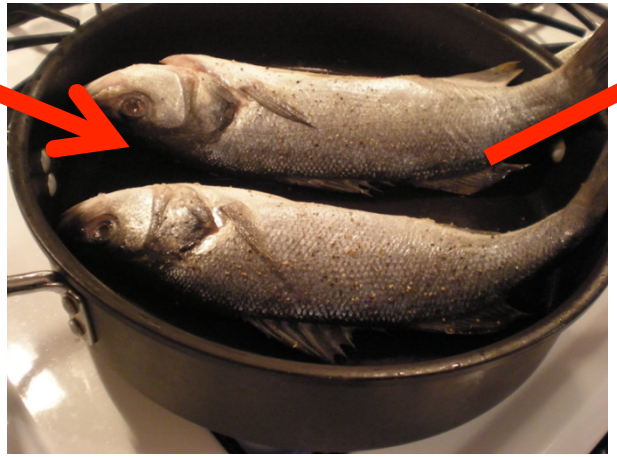
STYRENE



POLY-STYRENE

POLY-STYRENE





J Environ Sci (China). 2007;19(4):421-6.

Leaching of styrene and other aromatic co
water from PS bottles.

Ahmad M[1], Bajahlan AS.

Author information

Abstract

Bottled water may not be safer, or healthier, than tap water. T
that styrene and some other aromatic compounds leach conti
bottles used locally for packaging. Water sapmles in contact v
preconcentration technique called as "purge and trap" and an
mass spectrometer (GC/MS). Eleven aromatic compounds we
Maximum concentration of styrene in
benzene, toluene and benzene were
than WHO guide line values. All othe
storage time were the major factor in
increased to 69.53 microg/L after on

Food Addit Contam. 1998 Jul;15(5):592-9.

Polystyrene cups and cor

Tawfik MS[1], Huyghebaert A.

Author information

Abstract

The level of styrene migration from polystyrene cups wa
cold beverages (apple juice, orange juice, carbonated w
(0.0, 0.5, 1, 2, and 3.6% fat), take away foods (yogurt, je
50, and 100% ethanol) and olive oil. Styrene migration v
Drinking water gave migration values considerably lowe
milk or soup containing 3.6% fat. Maximum observed mi
styrene in the cup. Food simulants were responsible for
with milk, fromage, biogardes, and cheese) packed in p
the Netherlands. The level of styrene detected in the foods was always fat dependent.

PMID: 9829045 DOI: 10.1080/02652039809374686

[Indexed for MEDLINE]

Research Section

STYRENE MIGRATION FROM GENERAL-PURPOSE AND HIGH-IMPACT POLYSTYRENE INTO FOOD-SIMULATING SOLVENTS

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(Accepted 27 November 1991)

Abstract—General-purpose and high-impact polystyrenes (GPPS and HIPS, respectively) are used in many food-contact applications for the packaging of aqueous-based, fatty and dry foods. The correlation
e migration into food-simulating solvents is
onsumers to styrene from food-packaging
hanol and cooking oil from a GPPS and a
levels, have been completed at temperatures
that the amount of styrene migrating from
e root of the time of exposure, and the total
ual levels of styrene in the polymers. The
t of the residual levels of styrene in a given
um was not approached when the polymers
ol exposure studies. The calculated partition
to be independent of the residual levels of
ionships were observed between the logs of
e absolute temperature of exposure.

Diffusion factors:

- Temperature of food or drink
- Time length of exposure
- Fat content in food

Migration of Styrene Monomer From Thermoset Polyester Cookware Into Foods During High Temperature Applications

SM Jickells et al. Food Addit Contam 10 (5), 567-573. Sep-Oct 1993. more

Health Effects of Styrene

- **High Dose Exposure (industrial)**
  - Neurotoxic
    - Depression
    - Headache
    - Fatigue
    - Weakness
  - Nephrotoxic
  - Lymphotoxic
- **Chronic Low Dose Exposure = ??**

National Toxicology Program
Interagency FDA, CDC, NIH

2014

REVIEW OF THE
Styrene Assessment
IN THE National Toxicology Program
12th Report on Carcinogens

Committee to Review the Styrene Assessment in the
National Toxicology Program 12th Report on Carcinogens

Board on Environmental Studies and Toxicology

Division on Earth and Life Studies

National Research Council

NATIONAL ACADEMY OF SCIENCES
NATIONAL ACADEMY OF ENGINEERING
INSTITUTE OF MEDICINE
NATIONAL RESEARCH COUNCIL

In sum, the committee finds that compelling evidence exists to support a listing of styrene as, at a minimum, *reasonably anticipated to be a human carcinogen*. That conclusion is based on credible but limited evidence of carcinogenicity in traditional epidemiologic studies, on sufficient evidence of carcinogenicity in animals, and on convincing evidence that styrene is genotoxic in exposed humans.

Environment

1% landfill weight, 30% landfill space

Environment

- Very difficult to recycle
  - Needs to be clean
  - Only 0.2% of Styrofoam ends up recycled*
  - Foam Pack Industries
    - Only place in NJ to recycle Styrofoam

*2005. Use and Disposal of Polystyrene in California: A Report to the California Legislature

Environment

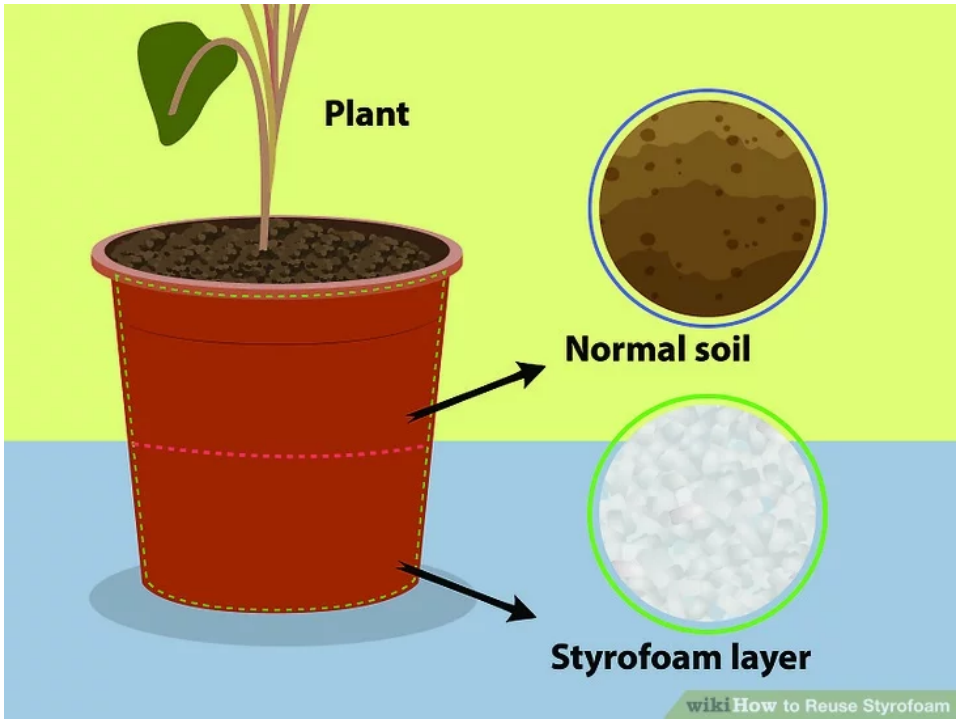
- Styrofoam is essentially not biodegradable
  - 50 to 500 years
    - (depending on the source and the conditions)
    - Think: If MLK or GW drank from a Styrofoam cup, that cup would still be around today

What can you do?

- Reduce

What can you do?

- Reuse



What can you do?