



Acrylamide

Acrylamide is a chemical formed when carbohydrate (starchy) foods are cooked. It is also present in tobacco smoke. Acrylamide is used to manufacture polyacrylamide chemicals used in water purification and sewage treatment, paper production, and some cosmetics and soap preparations.

How People Are Exposed to Acrylamide

Most people are exposed to acrylamide by eating such foods as potato chips, French fries, and coffee and by inhaling tobacco smoke. People who work in industries that make or use acrylamide can have higher exposures through skin contact or inhalation.

How Acrylamide Affects People's Health

Human health effects from environmental exposure to low levels of acrylamide are unknown. In the body, some acrylamide is converted to glycidamide. Both acrylamide and glycidamide can bind to hemoglobin, a large protein in the red blood cells. The resulting complexes are called hemoglobin adducts, which can be measured in people's blood. Exposure to large amounts of acrylamide can cause irritation of breathing passages, and if the exposure is long term, nerve damage. In laboratory animal testing, acrylamide caused reproductive problems, nerve damage, and cancer.

Levels of Acrylamide Adducts in the U.S. Population

In the *Fourth National Report on Human Exposure to Environmental Chemicals (Fourth Report)*, CDC scientists measured acrylamide and glycidamide hemoglobin adducts in the blood of more than 7,000 participants aged three years and older who took part in the National Health and Nutrition Examination Survey (NHANES) during 2003–2004. By measuring these hemoglobin adducts in blood, scientists can estimate the amount of acrylamide that has entered people's bodies.

- CDC scientists found measurable levels of acrylamide adducts in the blood of 99.9% of the U.S. population
- Measurable levels of glycidamide adducts were found in the blood of 97.5% of the U.S. population.
- Research has found that smokers have nearly twice the levels of acrylamide and glycidamide adducts in their blood than nonsmokers.

Finding a measurable amount of acrylamide or glycidamide hemoglobin adducts in blood does not mean that they cause an adverse health effect. Biomonitoring studies on levels of acrylamide provide physicians and public health officials with reference values so that they can determine whether people have been exposed to higher levels of acrylamide than are found in the general population. Biomonitoring data can also help scientists plan and conduct research on exposure and health effects.

For More Information

- Department of Health and Human Services
Dietary guidelines brochure
<http://www.health.gov/dietaryguidelines/dga2005/document/pdf/brochure.pdf>
- Centers for Disease Control and Prevention
Quit Smoking Facts and Tips
http://www.cdc.gov/tobacco/quit_smoking/index.htm
- Environmental Protection Agency
Consumer Factsheet on Acrylamide
http://www.epa.gov/OGWDW/contaminants/dw_contamfs/acrylami.html
- Food and Drug Administration
Acrylamide Questions and Answers
<http://www.cfsan.fda.gov/~dms/acryfaq.html>
- National Institute for Occupational Safety and Health
Acrylamide: A Review of the Literature
Detailed information about Acrylamide and public health is available at
<http://www.cdc.gov/niosh/pel88/79-06.html>

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