

Safety Data Sheet

o-Aminoazo- toluene

Division of Safety
National Institutes
of Health



WARNING!

THIS COMPOUND IS ABSORBED THROUGH THE SKIN AND THE INTESTINAL TRACT. IT IS TOXIC, CARCINOGENIC, AND MUTAGENIC. AVOID FORMATION AND BREATHING OF AEROSOLS.

LABORATORY OPERATIONS SHOULD BE CONDUCTED IN A FUME HOOD, GLOVE BOX, OR VENTILATED CABINET.

AVOID SKIN CONTACT: IF EXPOSED, WASH WITH SOAP AND WATER.

FOR EYE EXPOSURE, IRRIGATE IMMEDIATELY WITH LARGE AMOUNTS OF WATER. FOR INGESTION, DRINK MILK OR WATER. REFER FOR GASTRIC LAVAGE. FOR INHALATION, REMOVE VICTIM PROMPTLY TO CLEAN AIR. ADMINISTER RESCUE BREATHING IF NECESSARY. REFER TO PHYSICIAN.

IN CASE OF LABORATORY SPILL, WEAR PROTECTIVE CLOTHING DURING CLEANUP. AVOID SKIN CONTACT OR BREATHING OF AEROSOLS. USE ORGANIC SOLVENT TO DISSOLVE COMPOUND. WASH DOWN AREA WITH SOAP AND WATER. DISPOSE OF WASTE SOLUTIONS AND MATERIALS APPROPRIATELY.

A. Background

o-Aminoazotoluene (AAT) is a stable, golden-colored, crystalline solid. It is moderately toxic to rats and produces irritation on skin exposure in humans. AAT is carcinogenic in rodents and dogs and mutagenic in the Ames test. It has been used commercially to color oils, fats, and waxes.

B. Chemical and Physical Data

1. Chemical Abstract No.: 97-56-3

issued 10/82

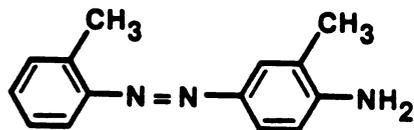
2. Synonyms:

AAT	Fast garnet GBC base
o-AT	C.I. Solvent yellow 3
o-AAT	4'-Amino-2,3'-azotoluene
C.I. 11160B	Brazilazina oil yellow R
Butter yellow*	o-Tolueneazo-o-toluidine
Fast oil yellow	4-(o-Tolylazo)-o-toluidine
o-Aminoazotoluol	5-(o-Tolylazo)-2-aminotoluene
Toluazotoluidine	4-Amino-2,3'-dimethylazobenzene
Hidaco oil yellow	2',3-Dimethyl-4-aminoazobenzene
2-Amino-5-azotoluene	Benzenamine, 2-methyl-4-[(2-methyl-phenyl)azo]- (9CI)

(For other trade names of dyes, see Fairchild et al., 1977.)

3. Molecular formula:
 $C_{14}H_{15}N_3$
 weight:
 225.32

structure:



4. Density: No data.
5. Absorption spectroscopy: UV (in 50% alcoholic N HCl solution):
 λ (log ϵ) = 326(4.28) and 490(3.40).
6. Volatility: No data.
7. Solubility: Soluble in ethanol, ether, chloroform, acetone, cellosolve, and toluene; practically insoluble in water.
8. Description, appearance: Golden-colored needles.
9. Boiling point: No data.
 Melting point: 101-102°C.
10. Stability: Stable under ordinary conditions.

*The name "Butter Yellow" has also been used for 4-dimethyl-aminoazobenzene.

11. Chemical reactivity: Reduced by zinc dust and HCl to hydrazo analog and aminotoluenes. Oxidized by hydrogen peroxide, organic peroxides, or potassium dichromate to azoxyderivative.
12. Flash point: No data.
13. Autoignition temperature: No data.
14. Explosive limits in air: No data.

Fire, Explosion, and Reactivity Hazard Data

1. AAT does not require special fire-fighting procedures or equipment and does not present unusual fire and explosive hazards.
2. No conditions contributing to instability are known.
3. No incompatibilities have been reported.
4. AAT does not require nonspark equipment. When handled in flammable solvents, the precautions required for such solvents apply.

Operational Procedures

The NIH Guidelines for the Laboratory Use of Chemical Carcinogens describe operational practices to be followed when potentially carcinogenic chemicals are used in NIH laboratories. The Guidelines should be consulted to identify the proper use conditions required and specific controls to be implemented during normal and complex operations or manipulations involving AAT.

1. Chemical inactivation: No validated method reported.
2. Decontamination: Turn off equipment that could be affected by AAT or the materials used for cleanup. If more than 1 g has been spilled or if there is any uncertainty regarding the procedures to be followed for decontamination, call the NIH Fire Department (dial 116) for assistance. Wash surfaces with copious quantities of water. Glassware should be rinsed (in a hood) with an organic solvent, followed by soap and water. Animal cages should be washed with water.
3. Disposal: No waste streams containing AAT shall be disposed of in sinks or general refuse. Surplus AAT or chemical waste streams contaminated with AAT shall be handled as hazardous chemical waste and disposed of in accordance with the NIH chemical waste disposal system. Nonchemical waste (e.g., animal carcasses and bedding) containing AAT shall be handled and packaged for incineration in accordance with the NIH medical-pathological waste disposal system. Potentially infectious waste (e.g., tissue cultures) containing AAT shall be disinfected

by heat using a standard autoclave treatment and packaged for incineration, as above. Burnable waste (e.g., absorbent bench top liners) minimally contaminated with AAT shall be handled as potentially infectious waste and packaged for incineration, as above. Absorbent materials (e.g., associated with spill cleanup) grossly contaminated shall be handled in accordance with the chemical waste disposal system. Radioactive waste containing AAT shall be handled in accordance with the NIH radioactive waste disposal system.

4. Storage: Store in sealed ampoules or screw-capped bottles (or vials) with Teflon cap liners.

Monitoring and Measurement Procedures Including Direct Field Measurements and Sampling for Subsequent Laboratory Analysis

1. Sampling: No data.
2. Separation and analysis: No specific information on either separation or analysis of AAT has been reported. The most widely used methods of analysis of compounds of this class involve TLC followed by spectrophotometric analysis.

Biological Effects (Animal and Human)

1. Absorption: AAT is absorbed from the gastrointestinal tract and through the skin.
2. Distribution: No specific data; since AAT exerts its prime action on liver tissue, it appears that it (or an active metabolite) is distributed to this tissue.
3. Metabolism and excretion: AAT is metabolized to a variety of compounds, particularly hydroxylated and azo-reduced derivatives. These compounds, as well as unchanged AAT, are excreted in the urine as conjugation derivatives such as N-glucuronides (IARC, 1975).
4. Toxic effects: There are no data on acute LD50 of AAT. The minimum lethal dose on oral administration to rats has been reported as 1.2 g/kg, which indicates slight toxicity. The chief target organs are the liver (cellular proliferation, glycogen depletion, mitochondrial abnormalities) and skin (irritation, protein and nucleic acid binding). Allergic reactions to skin exposures in humans have been reported.
5. Carcinogenic effects: Ingestion of AAT in the diet of rodents and dogs produces tumors of the liver, bladder, and lungs. Repeated skin application of a solution of AAT to mice results in liver tumors. Ingestion of AAT by pregnant mice produces liver tumors and lung adenomas, significantly above control levels, in the offspring and the following generation.

- AA
14
6. Mutagenic and teratogenic effects: AAT is mutagenic in the Ames test. There are no data concerning teratogenicity.

G. Emergency Treatment

1. Skin and eye exposure: For skin exposure, remove contaminated clothing and wash skin with soap and water. For eye exposure, irrigate immediately with copious quantities of running water for at least 15 minutes.
2. Ingestion: Drink plenty of milk or water. Refer for gastric lavage.
3. Inhalation: Remove victim promptly to clean air. Administer rescue breathing if necessary.
4. Refer to physician. Oxygen may be required during transport. Observe for methemoglobinemia.

H. References

- Fairchild, E.J., R.J. Lewis, Sr., and R.L. Tatken, eds. 1977. Page 920 in Registry of Toxic Effects of Chemical Substances, Vol. II. DHEW Publ. No. (NIOSH) 78-104-B. National Institute for Occupational Safety and Health, Cincinnati, OH.
- IARC, International Agency for Research on Cancer. 1975. Pages 125-146 in IARC Monograph on the Evaluation of Carcinogenic Risk of Chemicals to Man: Some Aromatic Azo Compounds, Vol. 8. World Health Organization, Geneva, Switzerland.