Chemical Treatability of Aniline; Concentration Process: Activated Carbons; Chemical Classification: Amines; Scale of Study: Isotherm Test; Type of Wastewater Used: Pure compound (one solute in a solvent); Results of Study: 74.9% removal; 251 ppm final concn, 0.15 g/g carbon capacity; (Filtrasorb 300 used. Solvents included pentaner acetone, diethyl ether, methylene chloride-acetone, methyl chloride-acetone, and acetone). [USEPA; Management of Hazardous Waste Leachate, EPA Contract No. 68-03-2766 p.E-137 (1982)] **PEER REVIEWED**

DISPOSAL METHODS

Chemical Treatability of Aniline; Concentration Process: Resin adsorption; Chemical Classification: Amines; Scale of Study: Batch flow, Laboratory scale; Type of Wastewater Used: Pure compound (one solute in a solvent); Result of Study: Complete removal; no desorption from resin by elutriation with solvent; (Resin was Amberlite XAD-2. Resin found to be more effective than carbon for phthalate esters, most aromatics, and pesticides; carbon was more effective for alkanes; not as effective for acidic compounds). [USEPA; Management of Hazardous Waste Leachate, EPA Contract No. 68-03-2766 p.E-186 (1982)] **PEER REVIEWED**

Leachate, EPA Contract No. 68-03-2766 p.E-38 (1982)] **PEER REVIEWED**

DISPOSAL METHODS

Chemical Treatability of Aniline; Concentration Process: Biological treatment; Chemical Classification: Amines; Scale of Study: Unknown; Type of Wastewater Used: Industrial Wastewater; Results of Study: 100% reduction in 15 hr; (Biodegradation by mutant Pseudomonas). [USEPA; Management of Hazardous Waste Leachate, EPA Contract No. 68-03-2766 p.E-38 (1982)] **PEER REVIEWED**

DISPOSAL METHODS

Chemical Treatability of Aniline; Concentration Process: Reverse osmosis; Chemical Classification: Amines; Scale of Study: Batch flow; Type of Wastewater Used: Pure compound (one solute in a solvent); Results of Study: 3.4% reduction with CA membrane; 82.9% reduction with C-PEI membrane; (CA and C-PEI membranes operated at 600 psig and room temperature). [USEPA; Management of Hazardous Waste Leachate, EPA Contract No. 68-03-2766 p.E-83 (1982)] **PEER REVIEWED**

DISPOSAL METHODS

Chemical Treatability of Aniline; Concentration Process: Reverse Osmosis; Chemical Classification: Amines; Scale of Study: Laboratory Scale; Type of Wastewater Used: Pure compound (one solute in a solvent); Results of Study: 80-100% reduction with NS-100-7 membrane; 60-80% reduction with B-10, NS-200 and NS-100 membranes; 40-60% reduction with B-9 membrane; 20-40% reduction with AP, CA3, and CAB membranes; < 20% reduction with SPPO and PBI membranes; 0% reduction with CA and CA-T membranes. [USEPA; Management of Hazardous Waste Leachate, EPA Contract No. 68-03-2766 p.E-83 (1982)] **PEER REVIEWED**

DISPOSAL METHODS

Chemical Treatability of Aniline; Concentration Process: Activated Carbons; Chemical Classification: Amines; Scale of Study: Batch flow, Laboratory scale; Type of Wastewater Used: Pure compound (one solute in a solvent); Results of Study: 100% reduction; No desorption from carbon by elutriation with solvents; (Filtrasorb 300 used. Solvents included pentane-acetone, diethyl ether, methylene, chloride-acetone, methyl chloride-acetone, and acetone). [USEPA; Management of Hazardous Waste Leachate, EPA Contract No. 68-03-2766 p.E-137 (1982)] **PEER REVIEWED**

DISPOSAL METHODS

1987. , p. 53] **PEER REVIEWED**

DISPOSAL METHODS

SRP: At the time of review, criteria for land treatment or burial (sanitary landfill) disposal practices are subject to significant revision. Prior to implementing land disposal of waste residue (including waste sludge), consult with environmental regulatory agencies for guidance on acceptable disposal practices. [CITATION] **PEER REVIEWED**

DISPOSAL METHODS

A) Dissolve in such combustible solvent as alcohols, benzene, etc. Spray the soln into the furnace with afterburner and scrubber. B) Pour into a mixture of sand or Na2CO3 /sodium carbonate/ (9:1). After mixing, put into a paper carton stuffed full with packing paper to serve as a fuel. Burn in a furnace. Recommendable methods: Incineration, chemical treatment, and discharge to sewer. Peer-review: Small amounts, react with hydrochloric acid, dissolve in water and flush to sewer in great dilution. (Peer-review conclusions of an IRPTC expert consultation (May 1985)) [United Nations. Treatment and Disposal Methods for Waste Chemicals (IRPTC File). Data Profile Series No. 5. Geneva, Switzerland: United Nations Environmental Programme, Dec. 1985. , p. 86] **QC REVIEWED**

DISPOSAL METHODS

A good candidate for liquid injection incineration at a temperature range of 650 to 1,600 deg C and a residence time of 0.1 to 2 seconds. A good candidate for rotary kiln incineration at a temperature range of 820 to 1,600 deg C and residence times of seconds for liquids and gases, and hours for solids. A good candidate for fluidized bed incineration at a temperature range of 450 to 980 deg C and residence times of seconds for liquids and gases, and longer for solids. [USEPA; Engineering Handbook for Hazardous Waste Incineration p.3-11 (1981) EPA 68-03-3025] **PEER REVIEWED**

DISPOSAL METHODS

Chemical Treatability of Aniline; Concentration Process: Biological Treatment; Chemical Classification: Amines; Scale of Study: Unknown; Type of Wastewater Used: Pure compound (one solute in a solvent); Results of Study: 94.5% reduction based on chemical oxygen demand; rate of biodegradation 19 mg. Chemical oxygen demand/g hr; (Activated sludge). [USEPA; Management of Hazardous Waste

quantities, absorb on paper towels. Evaporate in a safe place, (such as a fume hood). Allow sufficient time for the evaporating vapors to completely clear the hood's duct work. Burn the paper in a suitable location away from combustible materials. Large quantities can be collected & atomized in a suitable combustion chamber equipped with an appropriate effluent gas cleaning device. [Mackison, F. W., R. S. Stricoff, and L. J. Partridge, Jr. (eds.). NIOSH/OSHA - Occupational Health Guidelines for Chemical Hazards. DHHS(NIOSH) Publication No. 81-123 (3 VOLS). Washington, DC: U.S. Government Printing Office, Jan. 1981. , p. 4] **PEER REVIEWED**

CLEANUP METHODS

Environmental consideration: Land spill: Dig a pit, pond, lagoon, or holding area to contain liquid or solid material /SRP: until properly disposed/. Dike surface flow using soil, sand bags, foamed polyurethane, or foamed concrete. Absorb bulk liquid with fly ash or cement powder. Apply "universal" gelling agent to immobilize the spill. /SRP: If time permits, pits, ponds, lagoons, soak holes, or holding areas should be sealed with an impermeable flexible membrane liner./ [Association of American Railroads. Emergency Handling of Hazardous Materials in Surface Transportation. Washington, D.C.: Assoc. of American Railroads, Hazardous Materials Systems (BOE), 1987. , p. 53] **PEER REVIEWED**

CLEANUP METHODS

Environmental consideration: Water spill: Use natural deep water pockets, excavated lagoons, or sand bag barriers to trap material at bottom /SRP: until properly disposed/. If dissolved, in region of 10 ppm or greater concn, apply activated carbon at ten times the spilled amount. Remove trapped material with suction hoses. Use mechanical dredges or lifts to remove immobilized masses of pollutants and precipitates. [Association of American Railroads. Emergency Handling of Hazardous Materials in Surface Transportation. Washington, D.C.: Assoc. of American Railroads, Hazardous Materials Systems (BOE), 1987. , p. 53] **PEER REVIEWED**

CLEANUP METHODS

Environmental consideration: Air spill: Apply water or mist to knock down vapors. [Association of American Railroads. Emergency Handling of Hazardous Materials in Surface Transportation. Washington, D.C.: Assoc. of American Railroads, Hazardous Materials Systems (BOE),

NIOSH/OSHA - Occupational Health Guidelines for Chemical Hazards. DHHS(NIOSH) Publication No. 81-123 (3 VOLS). Washington, DC: U.S. Government Printing Office, Jan. 1981. , p. 5] **PEER REVIEWED**

PROTECTIVE EQUIPMENT & CLOTHING

Butyl rubber protective clothing ... [Sittig, M. Handbook of Toxic And Hazardous Chemicals. Park Ridge, NJ: Noyes Data Corporation, 1981. , p. 32] **PEER REVIEWED**

PROTECTIVE EQUIPMENT & CLOTHING

[ACGIH; Guidelines Select of Chem Protect Clothing Volume #1 Field Guide p.42 (1983)] For aniline, breakthrough times greater than one hour reported by (normally) two more testers for butyl rubber; For aniline, breakthrough times greater than one hour reported by (normally) two or more testers for natural rubber; For aniline, breakthrough times greater than one hour reported by (normally) two or more testers for neoprene; For aniline, breakthrough times greater than one hour reported by (normally) two or more testers for nitrile rubber; For aniline, there is some data suggesting breakthrough times of approximately an hour or more for polyvinyl alcohol; For aniline, breakthrough times less (usually significantly less) than one hour reported by (normally) two or more testers for polyvinyl chloride. [U.S. Coast Guard, Department of Transportation. CHRIS - Hazardous Chemical Data. Volume II. Washington, D.C.: U.S. Government Printing Office, 1984-5.] **PEER REVIEWED**

CLEANUP METHODS

/Absorb spilled aniline in/ vermiculite, dry sand, earth, or similar material ... /and properly dispose/. [Mackison, F. W., R. S. Stricoff, and L. J. Partridge, Jr. (eds.). NIOSH/OSHA - Occupational Health Guidelines for Chemical Hazards. DHHS(NIOSH) Publication No. 81-123 (3 VOLS). Washington, DC: U.S. Government Printing Office, Jan. 1981. , p. 4] **PEER REVIEWED**

CLEANUP METHODS

Small amounts, react with hydrogen chloride, dissolve in water ... /& dispose of properly/. [United Nations. Treatment and Disposal Methods for Waste Chemicals (IRPTC File). Data Profile Series No. 5. Geneva, Switzerland: United Nations Environmental Programme, Dec. 1985. , p. 86] **PEER REVIEWED**

CLEANUP METHODS

If ... spilled or leaked, the following steps should be taken: 1. Ventilate area of spill or leak. 2. For small

full facepiece operated in pressure-demand or other positive pressure mode. [Mackison, F. W., R. S. Stricoff, and L. J. Partridge, Jr. (eds.). NIOSH/OSHA - Occupational Health Guidelines for Chemical Hazards. DHHS(NIOSH) Publication No. 81-123 (3 VOLS). Washington, DC: U.S. Government Printing Office, Jan. 1981. , p. 5] **PEER REVIEWED**

FIRE FIGHTING PROCEDURES

Wear full protective clothing. [National Fire Protection Association. Fire Protection Guide on Hazardous Materials. 9th ed. Boston, MA: National Fire Protection Association, 1986. 49-18] **PEER REVIEWED**

PROTECTIVE EQUIPMENT & CLOTHING

POSSIBLE EXPOSURE TO HIGHER CONCN (PIPE BREAKAGE, SPLASHING, CLEANING OR REPAIR OF STORAGE TAMKS) NECESSITATES USE OF SAFETY GOGGLES, GAS MASK, APRON, & RUBBER GLOVES. [Lefaux, R. Practical Toxicology of Plastics. Cleveland: CRC Press Inc., 1968. , p. 106] **PEER REVIEWED**

PROTECTIVE EQUIPMENT & CLOTHING

RESPIRATOR FOR ORGANIC VAPORS, SPLASHPROOF GOGGLES ... & BOOTS. [U.S. Coast Guard, Department of Transportation. CHRIS - Hazardous Chemical Data. Volume II. Washington, D.C.: U.S. Government Printing Office, 1984-5.] **PEER REVIEWED**

PROTECTIVE EQUIPMENT & CLOTHING

Respiratory protection from aniline is as follows: vapor concentration of 100 ppm or less: a chemical cartridge respirator with a full facepiece and an organic vapor cartridge(s) or a gas mask with a chin-style front or back-mounted organic vapor canister or any supplied-air respirator with a full facepiece, helmet or hood, or any self-contained breathing apparatus with a full facepiece; greater than 100 ppm or entry and escape from unknown concentrations: self-contained breathing apparatus with a full facepiece operated in pressure demand or other positive pressure mode or a combination respirator which includes a type C supplied-air respirator with a full facepiece operated in pressure-demand or other positive pressure or continuous-flow mode and an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive pressure mode; escape: any gas mask providing protection against organic vapors or any self-contained breathing apparatus. [Mackison, F. W., R. S. Stricoff, and L. J. Partridge, Jr. (eds.).

Emergency Response Guidebook 1987. DOT P 5800.4. Washington, DC: U.S. Government Printing Office, 1987. G-57] **QC REVIEWED**

DOT EMERGENCY GUIDELINES

Spill or Leak: Shut off ignition sources; no flares, smoking or flames in hazard area. Do not touch spilled material; stop leak if you can do it without risk. Water spray may reduce vapor; but it may not prevent ignition in closed spaces. Small Spills: Take up with sand or other noncombustible absorbent material and place into containers for later disposal. Small Dry Spills: With clean shovel place material into clean, dry container and cover; move containers from spill area. Large Spills: Dike far ahead of liquid spill for later disposal. [Department of Transportation. Emergency Response Guidebook 1987. DOT P 5800.4. Washington, DC: U.S. Government Printing Office, 1987. G-57] **QC REVIEWED**

DOT EMERGENCY GUIDELINES

First Aid: Move victim to fresh air and call emergency medical care; if not breathing, give artificial respiration; if breathing is difficult, give oxygen. In case of contact with material, immediately flush skin or eyes with running water for at least 15 minutes. Speed in removing material from skin is of extreme importance. Remove and isolate contaminated clothing and shoes at the site. Keep victim quiet and maintain normal body temperature. Effects may be delayed; keep victim under observation. [Department of Transportation. Emergency Response Guidebook 1987. DOT P 5800.4. Washington, DC: U.S. Government Printing Office, 1987. G-57] **QC REVIEWED**

FIRE FIGHTING PROCEDURES

USE WATER SPRAY, DRY CHEM, FOAM, OR CARBON DIOXIDE. USE WATER TO KEEP FIRE EXPOSED CONTAINERS COOL. IF A LEAK OR SPILL HAS NOT IGNITED, USE WATER SPRAY TO DISPERSE THE VAPORS & TO PROVIDE PROTECTION FOR MEN ATTEMPTING TO STOP LEAK. WATER SPRAY MAY BE USED TO FLUSH SPILLS AWAY FROM EXPOSURES. PROTECTION IS REQUIRED FROM TOXIC VAPORS GIVEN OFF AT ELEVATED TEMPERATURES. [National Fire Protection Association. Fire Protection Guide on Hazardous Materials. 9th ed. Boston, MA: National Fire Protection Association, 1986. 49-18] **PEER REVIEWED**

FIRE FIGHTING PROCEDURES

Respiratory protection from aniline while firefighting is as follows: self-contained breathing apparatus with a

treated with activated carbon, and then the immobilized masses removed by mechanical dredges or lifts. Prior to implementing land disposal of waste residue (including waste sludge), consult environmental regulatory agencies for guidance. **PEER REVIEWED**

DOT EMERGENCY GUIDELINES

Health Hazards: Poisonous; may be fatal if inhaled, swallowed or absorbed through skin. Contact may cause burns to skin and eyes. Runoff from fire control or dilution water may cause pollution. [Department of Transportation. Emergency Response Guidebook 1987. DOT P 5800.4. Washington, DC: U.S. Government Printing Office, 1987. G-57] **QC REVIEWED**

DOT EMERGENCY GUIDELINES

Fire or Explosion: May be ignited by heat, sparks or flames. Container may explode in heat of fire. Vapor explosion and poison hazard indoors, outdoors or in sewers. [Department of Transportation. Emergency Response Guidebook 1987. DOT P 5800.4. Washington, DC: U.S. Government Printing Office, 1987. G-57] **QC REVIEWED**

DOT EMERGENCY GUIDELINES

Emergency Action: Keep unnecessary people away; isolate hazard area and deny entry. Stay upwind, out of low areas, and ventilate closed spaces before entering. Self-contained breathing apparatus and chemical protective clothing which is specifically recommended by the shipper or producer may be worn but they do not provide thermal protection unless it is stated by the clothing manufacturer. Structural firefighter's protective clothing is not effective with these materials. CALL CHEMTREC AT 1-800-424-9300 AS SOON AS POSSIBLE, especially if there is no local hazardous materials team available. [Department of Transportation. Emergency Response Guidebook 1987. DOT P 5800.4. Washington, DC: U.S. Government Printing Office, 1987. G-57] **QC REVIEWED**

DOT EMERGENCY GUIDELINES

Fire: Small Fires: Dry chemical, CO2, Halon, water spray or standard foam. Large Fires: Water spray, fog or standard foam is recommended. Move container from fire area if you can do it without risk. Cool container with water using unmanned device until well after fire is out. Fight fire from maximum distance. Stay away from ends of tanks. Dike fire control water for later disposal; do not scatter the material. [Department of Transportation.

headache, nausea, cardiac arrhythmias, shock, and death. The ACGIH recommends a workplace limit (TLV) of 2 ppm as an 8-hr time-weighted average (TWA) with a note to prevent skin contact. Compliance with the TLV should be accomplished by conducting aniline reactions in closed vessels and by employing general and local exhaust ventilation, as necessary. The aromatic amine-like odor of aniline may warn of its presence at a sub-TLV level of 1 ppm; however, to assure against exposure, it is recommended that workers involved with aniline (including firefighters) wear a full facepiece, self-contained breathing apparatus, and wear full protective clothing (including rubber gloves and boots). Further precautions include provision of eyewash stations and safety showers, prohibition of eating and smoking in aniline work areas, and the prompt removal of aniline-soaked clothing. While aniline must be heated before ignition will occur (autoignition temp: 615 deg C), its vapor can be ignited explosively in a wide range of concentrations (explosive limits: 1.3% to 25%) by sparks or flames (flash point: 70 deg C, closed cup). For fires involving aniline, extinguish with dry chemical, CO2, water spray, fog, or foam. From a distance, use water spray to knock down vapor and cool containers. Dike fire control water to prevent pollution and explosion hazards in sewers. Aniline should be stored in a cool, dry, well-ventillated location, away from sources of ignition, strong oxidizers, and activities which could cause physical damage to aniline containers. While aniline is shipped in a variety of containers including glass bottles, cans, drums, tank vehicles, tank cars, and tank barges, specific safety design features are required for such containers by the DOT. The poison label is used on containers shipped by rail and air (shipment is prohibited on passenger planes). Take up small spills of aniline with vermiculite, dry sand, or earth and place into containers for later disposal. Very small spills may be absorbed on paper towels and allowed to evaporate in a fume hood. Large spills on land should be contained in excavated pits, ponds, or other holding area and any surface flow diked with soil or sandbags. Water mist may be needed to knock down vapor. Apply universal gelling agent to immobilize the spill and absorb the bulk liquid with fly ash or cement powder. Large water spills may need to be trapped at the bottom with sandbag barriers,

SCENARIO - EMERGENCY RESPONSE

On a quiet summer evening, residents five miles south of the Baton Rouge rail yards were shook inside their homes and on their porches by a violent explosion. Emergency response teams quickly blanketed the site and helicopter surveillance revealed a major derailment of perhaps 20 cars of a 105 car train. The area was immediately sealed off to traffic but nothing could slow down the plumes of smoke drifting to the edge of the residential neighborhood. Bills of lading revealed the presence of hundreds of drums of aniline. While hospitals, fire departments, and shelters were being mobilized, one fire chief in a HAZMAT van used his laptop computer and modem to dial into the National Library of Medicine's TOXNET system and search its HAZARDOUS SUBSTANCES DATA BANK (**HSDB**) for information on aniline. By displaying the HAZARDS SUMMARY, he determined that the chemical, a solvent, was definitely flammable (no surprise), but also highly toxic if inhaled. This called for complete and immediate evacuation of the nearby community. Displaying the DOT EMERGENCY RESPONSE GUIDELINES provided further details about the hazards, first aid procedures, and how to contain the fire. Indeed, the entire SAFETY AND HANDLING category of HSDB's aniline record proved relevant, offering data on specific fire fighting procedures, reactivities of aniline with other chemicals, and PROTECTIVE EQUIPMENT AND CLOTHING that would have to be used by the firefighters for their safety in putting out the blaze and handling the materials. Finally, once the crisis was over, the people were safely moved away, and the fire was out, the CLEANUP METHODS and DISPOSAL METHODS fields were helpful in removing all traces of the chemical from the site and making it safe for people and wildlife again.

[HSDB] SS 1 /cf?
USER:
aniline (name)

Search in progress
SS (1) PSTG (1)

[HSDB] SS 2 /cf?
USER:
prt hazs, dot, firp, equp, clup, disp indented cont

1 - HSDB
NAME OF SUBSTANCE **ANILINE**
CAS REGISTRY NUMBER 62-53-3
HAZARDS SUMMARY

The major hazards encountered in the use and handling of aniline stem from its toxicologic properties and flammability. Exposure to this brown oily liquid may occur from its use as a solvent and as a chemical intermediate. Toxic by all routes (ie, ingestion, inhalation, skin contact), aniline can exert effects including contact burns to the skin and eyes, cyanosis,