

Safety Data Sheet: ADBAC / Benzalkonium Chloride

1. Identification

Product	Benzalkonium Chloride (ADBAC), 50% / 80% aqueous reference grades
Catalog identity	CAS 68424-85-1; EC 270-325-2; C12-16 alkyl dimethyl benzyl ammonium chloride
Recommended use	Industrial microbial-control and cationic-surfactant raw material. Not for direct consumer use.
Supplier contact	Hainan Zhongxin Chemical Co., Ltd. (ZXCHEM)
Office address	Room 1001, Building A, Caohejing Center, No. 1520 Gumei Road, Xuhui District, Shanghai, China
Telephone / email	+86-21-54265599 / sales@zxchem.com.cn
Emergency information	ZXCHEM office: +86-21-54265599, office hours, China time (UTC+8). For immediate medical emergencies contact local emergency services.
Document scope	Reference safety information for aqueous grades, compiled from published manufacturer data. Actual supplied solvent composition has not been verified; alcohol-based formulations are outside this scope.

2. Hazards Identification

50% reference classification	Acute toxicity (oral), Category 4; skin corrosion, Category 1B; serious eye damage, Category 1; aquatic acute and chronic hazard, Category 1.
80% reference classification	Acute toxicity (oral, dermal and inhalation), Category 4; skin corrosion, Category 1B; serious eye damage, Category 1. The transport reference identifies an environmental hazard / marine pollutant.
Signal word	Danger
50% hazard statements	H302: Harmful if swallowed. H314: Causes severe skin burns and eye damage. H410: Very toxic to aquatic life with long lasting effects.
Additional 80% hazards	H312: Harmful in contact with skin. H332: Harmful if inhaled.
Prevention	Avoid breathing mist. Prevent contact with skin and eyes. Use suitable gloves, protective clothing, goggles and face protection. Wash after work. Keep food and drink out of the handling area. Prevent environmental release.
Response	Obtain immediate medical help after exposure. For ingestion, rinse the mouth without inducing vomiting. Remove contaminated clothing and rinse exposed skin. Flush eyes with water and remove contact lenses when easy. Move inhalation casualties to fresh air.
Storage / disposal	Restrict access to corrosive-chemical storage. Collect leaks. Use an authorized waste contractor for product and contaminated containers.



3. Composition / Information on Ingredients

Mixture type	Aqueous quaternary ammonium chloride reference formulation
Benzalkonium chloride	50% grade: nominal 50% active; 80% grade: nominal 80% active. Catalog CAS 68424-85-1. Reference manufacturer identifiers include CAS 63449-41-2 (50%) and 8001-54-5 (80%), reflecting commercial homolog mixtures.
Water	CAS 7732-18-5; balance in the aqueous reference formulations. The cited 80% reference reports 20% water and 0% VOC.
Formulation boundary	These are reference compositions, not a certified analysis of a supplied batch. An ethanol-, isopropanol- or other solvent-containing formulation requires its own composition and hazard assessment.

4. First-Aid Measures

General	Protect rescuers from contact. Seek prompt medical assessment and give this document to the treating clinician.
Inhalation	Move to fresh air without exposing the rescuer. Obtain medical help. Breathing assistance should be provided by trained personnel if required.
Skin	Remove contaminated clothing promptly. Rinse affected skin thoroughly with flowing water. Seek immediate medical attention for corrosive exposure.
Eyes	Immediately flush with plenty of clean water. Remove contact lenses if this can be done easily, continue rinsing and obtain urgent eye-specialist care.
Ingestion	Rinse the mouth. Do not induce vomiting or attempt chemical neutralization. Do not give anything orally to an unconscious person. Obtain emergency medical help.
Important effects	Chemical burns and severe eye injury; oral exposure is harmful. The 80% reference also indicates harmful dermal and inhalation exposure. Treatment is supportive and directed by medical personnel.

5. Fire-Fighting Measures

Extinguishing media	Foam, carbon dioxide or dry chemical, selected for the surrounding fire.
Specific hazards	Heating or fire can release hazardous, irritating or corrosive fumes. Do not infer alcohol-formulation flash points from this aqueous reference.
Firefighter protection	Use self-contained breathing equipment and protective fire-response clothing. Keep contaminated firefighting runoff away from waterways.

6. Accidental Release Measures

Personnel	Isolate the affected area. Avoid mist and direct contact. Only trained, protected personnel should approach a leak. Provide ventilation where safe.
Environment	Protect drains, soil and waterways. Contain the spill; notify appropriate authorities if a significant release reaches the environment.
Cleanup	Stop the leak if safe. Use inert liquid-binding material, collect into compatible labelled containers and arrange authorized disposal. Do not flush concentrated product into drains.
References	See Sections 8 and 13 for protection and disposal.

7. Handling and Storage

Handling	Use controlled transfer and ventilation. Minimize splashing and aerosol formation. Avoid contact with skin and eyes; maintain access to eyewash and safety showers.
Storage	Keep containers sealed in a cool, dry and ventilated area with controlled access. Protect against contamination and direct sunlight. Use chemically compatible containers and spill containment.
Separation	Keep separate from food, strong oxidizing agents and incompatible chemicals. Do not mix with anionic formulation ingredients without a compatibility assessment.
Specific use	Industrial formulation; evaluate the complete formulation and intended use before scale-up.

8. Exposure Controls / Personal Protection

Exposure limits	No product-specific occupational exposure limit is reported in the cited aqueous references. Apply local workplace requirements.
Engineering controls	Provide suitable local extraction where mist is generated. Use containment and keep emergency wash facilities accessible.
Eye / face	Chemical-splash goggles and appropriate face protection.
Hands / body	Chemical-resistant gloves, protective clothing and footwear. Choose glove material and service life with the glove supplier for the actual formulation.
Respiratory	Use appropriate approved respiratory protection when ventilation cannot control airborne exposure; select equipment through a workplace risk assessment.
Hygiene / environment	Remove contaminated garments, wash after handling and keep product out of drains.

9. Physical and Chemical Properties

Appearance	Clear, colorless to pale yellow liquid; the 80% aqueous reference may be viscous.
Active content	Commercial specification: 50% grade, 50 +/- 1%; 80% grade, 80 +/- 2%.
pH	Commercial specification: 5.0-8.0; test dilution and method are not stated here.
Water solubility	Soluble
Molecular formula / weight	Commercial homolog mixture; no single molecular formula or molecular weight assigned.
Odour / threshold	No product-specific data available.
Melting / freezing / boiling point	No product-specific data available.
Flash point / flammability limits	No measured data established for the ZXCHEM formulation in this reference. The cited aqueous 80% reference reports flash point as not applicable.
Density / vapour pressure / viscosity	No product-specific measured values established in this reference.
Partition coefficient / decomposition / ignition	No product-specific data available.

10. Stability and Reactivity

Stability	Aqueous references are stable under normal recommended handling and storage.
Conditions to avoid	Excessive heat, contamination and uncontrolled contact with incompatible materials.
Incompatibilities	Strong oxidizing agents; assess other reagents and formulation additives for compatibility.
Hazardous reactions / decomposition	No specific hazardous reaction is established for this catalog formulation. Thermal decomposition or fire can generate hazardous fumes.

11. Toxicological Information

Exposure routes	Ingestion, skin or eye contact, and inhalation of mist.
Acute effects	Harmful oral exposure; the 80% reference also identifies harmful dermal and inhalation exposure. Severe skin corrosion and eye injury are the principal local effects.
80% reference estimates	reference ATE values: oral 625 mg/kg; dermal 1,375 mg/kg; inhalation 1.88 mg/L over 4 hours. These are reference-mixture estimates, not measurements of ZXCHEM batches.
Other endpoints	Product-specific sensitization, mutagenicity, carcinogenicity, reproductive toxicity, repeated exposure and aspiration data are not established in this reference. Absence of a value does not indicate absence of hazard.

12. Ecological Information

Aquatic hazard	The 50% reference identifies Category 1 acute and chronic aquatic hazards. The 80% reference identifies an environmental transport hazard and marine pollutant status.
Release control	Prevent discharge to surface water, groundwater and sewers, including contaminated wash water.
Persistence / accumulation / mobility	No product-specific values established in this reference.
PBT / vPvB / endocrine effects	No formulation-specific assessment has been performed for this reference document.

13. Disposal Considerations

Product	Send surplus and collected waste to an authorized chemical-waste facility in accordance with applicable requirements. Do not discard into domestic waste or drains.
Packaging	Treat contaminated containers as chemical waste. Do not reuse for unrelated materials. Disposal or cleaning should be handled through a qualified waste contractor.

14. Transport Information

Dangerous goods category	Class 8 - Corrosive. The published 50% and 80% aqueous references both classify the product as dangerous goods.
50% aqueous reference: ADR/RID	UN 1760; CORROSIVE LIQUID, N.O.S. (benzalkonium chloride); Class 8; packing group II.
50% aqueous reference: IMDG / IATA	UN 1760; CORROSIVE LIQUID, N.O.S. (benzalkonium chloride); Class 8; packing group II.
80% aqueous reference: ADR/RID	UN 3265; CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (benzalkonium chloride); Class 8; packing group III. Environmentally hazardous.
80% aqueous reference: IMDG / IATA	UN 3265; CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (benzalkonium chloride); Class 8; packing group III. IMDG marine pollutant: yes.
Environmental marking	Apply the environmental / marine-pollutant marking specified by the selected formulation and transport mode.
Special precautions	Use approved packaging and trained dangerous-goods personnel. Reference UN entries and packing groups differ; select the shipping declaration for the actual supplied formulation rather than concentration alone.
Maritime bulk	Not intended for maritime carriage in bulk under this reference document.

15. Regulatory Information

Regulatory scope	This document follows the sixteen-section GHS SDS structure and reports reference safety information. It does not certify market authorization, registration or compliance of a supplied batch.
Restrictions / registrations	Assess applicable industrial-use, biocide and workplace requirements for the destination. No third-party REACH number, UFI, TSCA exemption or product approval is transferred to ZXCHEM.
Chemical safety assessment	A formulation-specific chemical safety assessment has not been carried out for this reference document.

16. Other Information

Document type	Aqueous reference SDS for technical evaluation; manufacturer sources were consulted for the specified reference grades.
Applicability	Reference manufacturer CAS identifiers and formulations differ from the catalog C12-16 identifier. This document must not be represented as a verified manufacturer analysis or used for a different solvent formulation.
Training	Personnel should be trained in corrosive-liquid handling, emergency response, environmental containment and dangerous-goods shipping.
Abbreviations	ADR/RID: road/rail dangerous-goods rules; IMDG: maritime dangerous-goods code; IATA: air transport rules; ATE: acute toxicity estimate; GHS: globally harmonized hazard system; PG: packing group.
Document scope	Reference safety information for the material and grade described in Sections 1 and 3. Different concentrations, solvents or formulations require the applicable safety information. This is not a batch analytical certificate.

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