

Technical Data Sheet (TDS)

Issue Date: 25 FEB 2026 Version: V1.0

1. Product Overview

- **Product Name:** A.T.G (Ammonium Thioglycolate)
- **Chemical Name:** Ammonium mercaptoacetate / Thioglycolic acid ammonium salt
- **CAS Number:** 5421-46-5
- **Molecular Formula:** $C_2H_7NO_2S$ ($HSCH_2COONH_4$)
- **Molecular Weight:** 113.15 g/mol
- **Product Trait:** Colorless to pale yellow clear aqueous liquid (80-85% concentration) with slight mercaptan odor; Class 8 corrosive substance, causes serious eye damage and skin irritation; non-flammable, stable under normal storage conditions; fully miscible with water, soluble in low alcohols; core active ingredient for hair perming/straightening cosmetics, also used as metal cleaning agent and organic synthesis intermediate. **FOR INDUSTRIAL AND COSMETIC (HAIR CARE) USE ONLY.**
- **Core Properties:** High assay (80-85%), low free ammonia content ($\leq 0.5\%$), stable pH (6.5-8.5); excellent reducing property (key for hair disulfide bond breaking); good solubility in water and cosmetic raw materials; stable in sealed storage for 18 months; meets industrial and cosmetic grade quality standards (compliant with EU/US/FDA cosmetic regulations).
- **Main Application:** Cosmetic raw material (hair perming/straightening agents, hair care products); metal surface treatment (oxide scale removal for steel/copper); organic synthesis intermediate (thiol compound synthesis); textile auxiliaries (fiber softener and reducing agent); electroplating additives (metal surface brightener). **NOT FOR FOOD, PHARMACEUTICAL OR MEDICAL USE.**

2. Technical Specifications (Industrial/Cosmetic Grade, Complies with GB/EU/FDA Standards)

Item	Specification (Industrial/Cosmetic Grade)
Appearance	Colorless to pale yellow clear liquid, no turbidity
Assay (Ammonium Thioglycolate)	80.0-85.0%
pH Value (25°C)	6.5-8.5
Density (25°C)	1.10-1.15 g/cm ³
Viscosity (25°C)	15-30 mPa·s
Free Ammonia Content	$\leq 0.5\%$
Water Content	15.0-20.0%
Heavy Metals (Pb)	≤ 5 ppm
Heavy Metals (As)	≤ 1 ppm
Iron (Fe)	≤ 10 ppm
Chloride (Cl ⁻)	$\leq 0.05\%$
Sulfate (SO ₄ ²⁻)	$\leq 0.05\%$
Decomposition Temperature	$\geq 120^\circ\text{C}$
Storage Stability (25°C, 12 months)	Assay retention $\geq 98.0\%$
Cosmetic Compatibility	Stable with non-oxidizing hair care raw materials (pH 6.0-8.0)

3. Product Advantages

1. **High Purity & Stable Quality:** Assay 80-85% with low free ammonia ($\leq 0.5\%$); batch-to-batch consistency (CV $\leq 0.5\%$) ensures stable reducing performance in hair perming and industrial applications; low heavy metal content meets cosmetic grade requirements.
2. **Excellent Reducing Property:** Strong and controllable reducing activity, effectively breaks hair disulfide bonds (key for perming/straightening) without excessive hair damage; ideal reducing agent for metal surface treatment and organic synthesis.
3. **Good Solubility & Compatibility:** Fully miscible with water, soluble in methanol/ethanol and common cosmetic raw materials; stable in cosmetic formulations with pH 6.0-8.0; compatible with non-oxidizing hair care ingredients (conditioners, humectants, thickeners).



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4. **Stable Storage Performance:** 18-month shelf life (unopened, $\leq 25^{\circ}\text{C}$); no significant decomposition or purity loss when sealed; slight pH change over time (no effect on activity); resistant to light when stored in amber glass containers.

4. Application Fields & Dosage Guide

4.1 Main Application Fields

- **Cosmetic Industry (Hair Care):** Core raw material for cold perming lotions, hair straightening creams, and permanent wave products; breaks hair disulfide bonds to reshape hair; suitable for all hair types (normal, dry, colored).
- **Metal Surface Treatment:** Reducing agent and cleaning agent for steel/copper/aluminum surface treatment; removes oxide scale and rust; improves metal surface finish and adhesion for coating/plating.
- **Organic Synthesis:** Intermediate for the synthesis of thiol compounds, pharmaceutical intermediates and fine chemicals; reducing agent in organic reaction systems (e.g., reduction of double bonds).
- **Textile & Electroplating:** Textile auxiliaries (fiber softener, reducing agent for dyeing); electroplating additives (brightener for nickel/copper plating, improves plating layer uniformity).

4.2 Recommended Dosage (By Application Field)

Application Field	Dosage (w/w in formulation/solution)
Cosmetic - Hair Perming Lotion	5.0-15.0% (main active ingredient)
Cosmetic - Hair Straightening Cream	8.0-20.0% (main active ingredient)
Metal Treatment - Oxide Scale Removal	10.0-30.0% (aqueous cleaning solution)
Organic Synthesis - Reducing Agent	5.0-40.0% (depending on reaction type)
Textile - Dyeing Reducing Agent	2.0-8.0% (dyeing bath)
Electroplating - Brightener	0.1-1.0% (plating bath)

5. Usage & Formulation Guidelines

- **Cosmetic (Hair Perming Lotion):** Dilute the product with deionized water to 5-15% concentration; adjust the formulation pH to 7.0-8.0 with ammonia water (10%) or citric acid (5%); add thickeners (e.g., carbomer) and humectants (e.g., glycerol) and stir evenly (200-300 rpm, 25°C); avoid adding oxidizing ingredients (e.g., hydrogen peroxide). Application: Apply to hair for 10-20 minutes (depending on hair thickness), rinse with water, then use oxidizing fixative.
- **Metal Surface Cleaning:** Dilute the product with deionized water to 10-30% concentration; add a small amount of surfactant (0.5-1.0%) to improve wetting; immerse the metal workpiece in the solution for 5-15 minutes ($25-40^{\circ}\text{C}$); rinse the workpiece with clean water and dry immediately; neutralize the residual solution with dilute acid (1% HCl) if needed.

6. Packaging & Storage

- 500 mL Amber glass bottle (cosmetic laboratory/R&D/small-batch use, anti-leakage screw cap + light protection)
- 5 L HDPE plastic drum (cosmetic medium-batch use, inner seal + anti-leakage cap)
- 25 L HDPE plastic drum (industrial/cosmetic bulk use, double anti-leakage cap + handle)
- 200 L HDPE plastic drum (large-scale industrial use, metal frame + anti-leakage valve)
- **Custom Packaging:** 1 L amber glass bottles (cosmetic sample use); 10 L HDPE drums (small-scale industrial use) available upon request (all chemical-resistant and anti-leakage).

7. Safety & Protection

- The product is a **Class 8 corrosive substance**, causes **serious eye damage, skin irritation and respiratory irritation**; **all operations must be conducted by trained professional personnel** with full specified PPE (full face shield, chemical-resistant safety goggles, nitrile rubber gloves $\geq 0.40\text{mm}$, chemical-resistant apron/neoprene suit, half-face air-purifying respirator).
- Operate in a well-ventilated area with local exhaust ventilation; install hydrogen sulfide/ammonia gas detection alarms in the work area; keep emergency eye wash station and safety shower within 10 meters of the operation area (for immediate flushing).