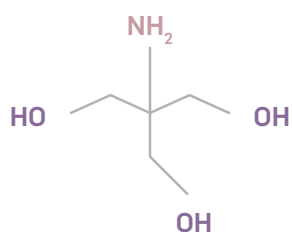
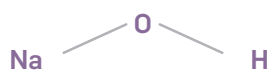


THE FACTS ABOUT FORMULATING WITH TRIS AMINO™ ULTRA PC

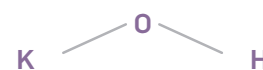
TROMETHAMINE (TRIS)



NaOH



KOH



VS.

and

INCI: Tromethamine	INCI: Potassium Hydroxide	INCI: Sodium Hydroxide
IUPAC: 2-amino-2-(hydroxymethyl)-1,3-propanediol	IUPAC: sodium hydroxide	IUPAC: potassium hydroxide
MW: 121.14 (g/mol)	MW: 40.00 (g/mol)	MW: 56.11 (g/mol)
CAS: 77-86-1	CAS: 1310-73-2	CAS: 1310-58-3
EINECS: 201-064-4	EINECS: 215-185-5	EINECS: 215-181-3
Synonyms: TRIS AMINO™, Tris, tromethamine, trometamol, THAM, tris(hydroxymethyl)-aminomethane, TRIZMA®	Synonyms: sodium oxidanide, caustic soda, lye, ascarite, white caustic, sodium hydrate	Synonyms: caustic potash, potash lye, potassia, potassium hydrate

SUMMARY OF CHEMISTRIES

TROMETHAMINE (TRIS)	NaOH AND KOH
Weak organic base	Strong alkali
Primary amine with α-carbon fully substituted	Inorganic compound consisting of a metal cation, M ⁺ and a hydroxide anion, OH ⁻

IMPLICATIONS OF CHEMICAL STRUCTURE

TROMETHAMINE (TRIS)	NaOH AND KOH
pKa = 8.1	pKa = 15.7
Non-corrosive	Corrosive
Endothermic dissolution in water	Highly exothermic dissolution in water
Does not require any special transportation	Requires special transportation

Tromethamine has become a preferred buffer and mild neutralizing amine versus commodity neutralizers typically used in personal care and cosmetics applications. TRIS AMINO™ ULTRA PC from ANGUS Chemical Company is a high-purity tromethamine that is globally compliant for use in cosmetic and personal care products.

RELATIVE PERFORMANCE OF FORMULATED PRODUCT	TROMETHAMINE (TRIS)	CAUSTICS (KOH/NaOH)
Buffering capacity	Functions as buffering agent from pH 7-9	No buffering capacity
Ease of pH adjustment with weak acids commonly used in formulations	Easy - Gradual change in pH as dosage increases	Difficult - Rapid change in pH near equivalence point
Salt tolerance	Minimal viscosity changes after long-term storage; formulation able to withstand ion disruption	Viscosity changes after long-term storage; formulation unable to tolerate salt disruption
Ethanol tolerance in carbomer gel	Forms a clear and viscous gel at up to 60% w/w ethanol content	Gel matrix breaks down and forms a hazy liquid when ethanol content exceeds 40% w/w
Emulsifier capability (as a salt of stearic acid)	Reduces particle sizes of oil droplets and enhances emulsion stability	Does not reduce particle size of oil droplets as efficiently
Appearance of formulations incorporating stearic acid (e.g. paste, cream, lotion, emulsion, etc.)	Pearlescent / shiny	Dull
Bio-enhancement of 1,2-hexanediol	Enhances antimicrobial activity of 1, 2-hexanediol	No observed impact on the antimicrobial activity of 1,2-hexanediol
Compatibility with PBSA in sunscreens	Able to completely solubilize PBSA at pH 7	Unable to effectively solubilize PBSA at pH lower than 10
TiO2 / ZnO dispersion in sunscreens	Improved and stable dispersion of TiO2 / ZnO used in formulation; improves particle size distribution	Agglomeration of pigments after extended storage
Foaming performance (self-foaming cleanser formulation)	Enables low pH fatty acid-based formulation that can generate stable and creamy foam	Does not enable comparable formulation to generate stable and creamy foam; requires costly specialty foam boosters or film formers for similar performance; formulation end pH is much higher
Cleansing of oily materials from skin (self-foaming cleanser formulation)	Effective removal of makeup from skin	Less effective in removal of makeup from skin
CMC and surface tension (as salts of stearic, myristic and lauric acids)	Greatly lowers the CMC and surface tension of surfactant solutions	CMC and surface tension of surfactant solutions are much higher

FORMULATING TIP

TRIS AMINO ULTRA PC is sold as a crystalline solid and, for the best results, should be incorporated into aqueous phase or as aqueous solution into formulation.



DISCOVER A **BETTER** WAY.

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