



A safe, economical, paraben-free alternative for wipes

Kalama[®] and Purox[®]

Benzoate Preservatives & Antimicrobials for Wipes Preservation

- **Globally Trusted:** Control yeasts, molds, and bacteria in wipes and other personal care formulations up to pH 6.5 (approved for use in leave-on and rinse-off products)
- **Highest Purity Available:** Virtually odorless and colorless (superior color stability over other paraben alternatives and low-purity benzoates, which may yellow) and free of irritant impurities, with low water content
- **Versatile:** Can be used in combination with other materials or boosters to extend preservation
- **Green:** Nature identical, biodegradable, and listed for use in products certified under green label programs, such as Ecocert COSMOS, EU Ecolabel, and Nordic Swan
- **Gentle:** Sodium Benzoate is considered non-irritating to the skin by a WHO assessment

Safe, Effective Preservation for Personal Care Wipes Applications

Wipes present many unique challenges for the formulator. Long storage times, evaporation, and interaction between the liquid formula and substrate are complications that make wipes particularly susceptible to microbial contamination. In addition, consumer preference and regulatory restrictions increasingly favor preservatives free of parabens, sensitizers, and formaldehyde donors.

Purox[®] S Sodium Benzoate, and **Kalama[®] Benzyl Alcohol** are safe, gentle, effective alternatives to preserve freshness and maintain the integrity of personal care, baby, and wet wipes. Unlike other alternatives to preservatives under pressure, they are **economical, effective even at low use levels, do not interfere with the desired fragrance profile**, and offer **good color and viscosity stability**.

Model Formulations and Efficacy Testing

Emerald tested the preservation efficacy of Emerald benzoate preservatives. In the model formulations shown on the following page, the preservatives demonstrated excellent performance and ingredient synergies by inhibiting the growth of undesirable organisms.

- **Method:** Modified PCPC M5 Method (accelerated). Double inoculation.
- **Substrate:** Medline Nature Soft Flushable Dry Wipes (C-fold, 100 4.5" x 6.5", cellulose/wood pulp composition, 3:1 ratio of liquid base to substrate)
- **Organisms:** P. aeruginosa, B. cepacia, E. coli, S. aureus (bacteria); A. brasiliensis, C. albicans, P. pinophilum (fungi)



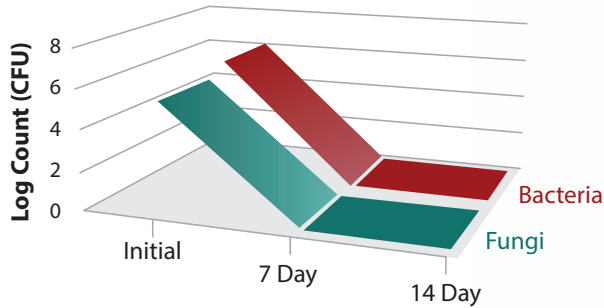
Emerald Performance Materials[®]
Kalama Chemical



Toning Wet Wipes, pH 5.5

Ingredient	Function	Wt (%)
Water	Carrier	Q.S.
Glycerin	Humectant	3.00
Sodium Lauroyl Methyl Isethionate	Surfactant	2.80
Cocoamidopropyl Betaine	Surfactant	1.55
Purox® S or Kalama® Sodium Benzoate	Preservative	0.50

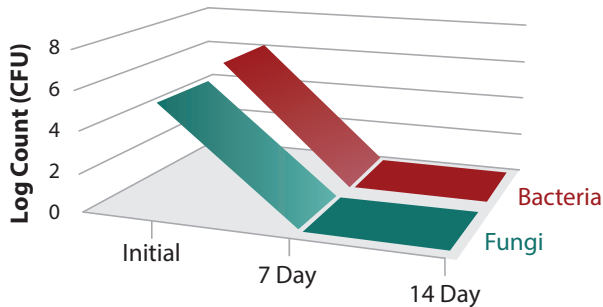
Preservation Efficacy: Toning Wet Wipes



Cleansing Wet Wipes, pH 4.5

Ingredient	Function	Wt (%)
Water	Carrier	Q.S.
Xanthan Gum	Rheology Modifier	0.30
Purox® S or Kalama® Sodium Benzoate	Preservative	0.50
SLES-2	Surfactant	1.26
Glycerin	Humectant	0.20

Preservation Efficacy: Cleansing Wet Wipes



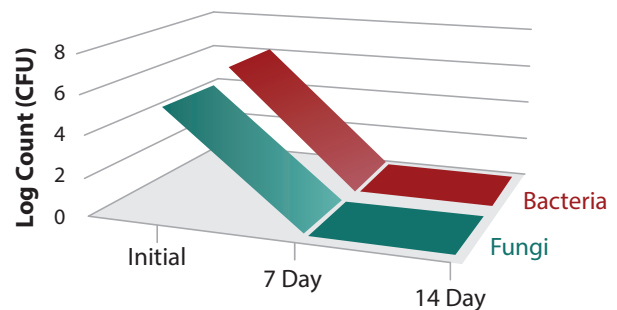
Purox®



Gentle Wet Wipes, pH 5.5

Ingredient	Function	Wt (%)
Water	Carrier	38.00
Glycerin	Humectant	5.00
Purox® S or Kalama® Sodium Benzoate	Preservative	0.50
Mineral Oil	Emollient	2.00
Vitamin E Acetate	Antioxidant	0.20
Methyl Glucose Dioleate	Surfactant	0.20
Caprylyl Glycol	Emollient, Humectant	0.25
Acrylates/C10-C30 Alkyl Acrylate	Emulsifier	0.25
Crosspolymer		
Sodium Hydroxide (5%)	pH adjuster	0.50
Coco-glucoside	Surfactant	1.00
Water	Carrier	Q.S.

Preservation Efficacy: Gentle Wet Wipes



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