

Certificate of Analysis

Product: Benzalkonium Chloride 50% Solution NF

Item Number: BZKNF50

Grade: NF

Lot Number: 5000131/1.1

Manufacture Date: 12/31/2019

Expiration Date: 12/30/2024

Country of Origin: United States

Tested Property	Specification	Analysis
Assay, Total C17H30ClN	47.5 -52.5% w/v	50.2
Description	Clear liquid to slightly yellow	Clear Liquid
Odor	Slightly aromatic odor	Aromatic odor
Analysis	White ppt. is formed dissolves after adding 5ml alcohol	Passes
Chloride	A solution of it in equal volumes of water and alcohol	Passes
Identification C	Orange-Red Color is produced	Passes
HPLC Retention Time	Retention Time Corresponds to Standard	Passed
Alkyl Chain C12	$\pm 40.0\%$	Passes
Alkyl Chain C14	$\pm 20.0\%$	Passes
Total alkyl ammonium chlorides	47.5-52.5%	Passes
Limit of Amine and Amine Salts	No Perceptible odor	Passes
Free Amine (Mw226) mmol/g	± 0.1	0.018
Amine HCL (Mw262.5), mmol/g		0.011
Alcohol Content if added	None Added	0.0000% none detected
Benzyl Alcohol	$\pm 0.5\%$	Passes
Benzaldehyde	$\pm 0.15\%$	Passes
Chloromethyl Benzene	$\pm 0.05\%$	Passes
Acidity or Alkalinity	± 0.1 ml 0.1N HCL or 0.1N NaOH	passes
Assay, Total alkyl ammonium chloride	47.5 -52.5% w/v	50.2
Description	Clear liquid to slightly yellow	Clear Liquid

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Odor	Slightly aromatic odor	Aromatic odor
Identification A	White ppt. is formed dissolves after adding 5ml alcohol	Passes
Identification B (Chloride)	A solution of it in equal volumes of water and alcohol	Passes
Identification C	Orange-Red Color is produced	Passes
Identification D	Retention Time Corresponds to Standard	Passed
Alkyl Chain C12	≥40.0%	69.0
Alkyl Chain C14	≥20.0%	27.0
Total alkyl chain C12 +C14	≥70.0%	96.0
Limit of Amine and Amine Salts	No Perceptible odor	Passes
Free Amine (Mw226) mmol/g	≤0.1	0.018
Amine HCL (Mw262.5), mmol/g	≤0.1	0.011
Alcohol Content if added	None Added	0.0000% none detected
Benzyl Alcohol	≤0.5%	0.001
Benzaldehyde	≤0.15% None detected @ 0.0001% limit	
Chloromethyl Benzene	≤0.05% None detected at 0.0001% limit	
Acidity or Alkalinity	≤0.1ml 0.1N HCL or 0.1N NaOH	Passes
Microbial Enumeration		
Aerobic Plate count	<10cfu/g	Passes
	Yeast & Mold	<10cfu/g Passes
	USP Candida Albicans	None Detected
	USP Aspergillus Brasiliensis	None Detected
	USP Bile Tolerant Gram-Neg.	None Detected
	USP Clostridia sp.	None Detected
	USP Escherichia Coli	None Detected
	USP Staphylococcus sp.	None Detected
	USP Pseudomonas Aeruginosa	None Detected
	USP Salmonella sp.	None Detected
pH of a 10% solution	7.0 - 8.0	7.7

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