Designation: D 501 – 03

Standard Test Methods of Sampling and Chemical Analysis of Alkaline Detergents[1]

This standard is issued under the fixed designation D 501; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 These test methods cover procedures for the sampling and chemical analysis of inorganic alkaline detergents.

1.2 The procedures appear in the following order:

	Sections
Caustic Soda:	
Sampling	5
Total Alkalinity as Sodium Oxide (Na_2O)	6-8
Sodium Hydroxide (NaOH)	9-11
Carbonate as Sodium Carbonate (Na_2CO_3)	12
Carbon Dioxide (CO_2) by the Evolution Method	13-16
Soda Ash:	
Sampling	17
Matter Volatile at 150 to 155°C	18 and 19
Total Alkalinity as Sodium Carbonate (Na_2CO_3)	20-22
Sodium Bicarbonate ($NaHCO_3$)	23-25
Sodium Bicarbonate ($NaHCO_3$) by Potentiometric Titration	26-28
Matter Insoluble in Water	29 and 30
Apparent Density	31 and 32
Modified Soda (Sequicarbonate Type):	
Sampling	33
Total Alkalinity as Sodium Oxide (Na_2O)	34-36
Sodium Bicarbonate ($NaHCO_3$) and Sodium Carbonate (Na_2CO_3)	37-39
Matter Insoluble in Water	40
Sodium Bicarbonate:	
Sampling	41
Sodium Bicarbonate, Sodium Carbonate, and Free Moisture	42-45
Matter Insoluble in Water	46
Sodium Metasilicate, Sodium Sesquisilicate and Sodium Orthosilicate:	
Sampling	47
Total Alkalinity as Sodium Oxide (Na_2O)	48-50
Total Silica as SiO_2	51-53
Sodium Metasilicate ($Na_2SiO_3 \cdot 5H_2O$)	54
Sodium Sesquisilicate ($3Na_2O \cdot 2SiO_2 \cdot 11H_2O$)	55
Matter Insoluble in Water	56 and 57
Loss on Ignition of Sodium Sesquisilicate ($3Na_2O \cdot 2SiO_2 \cdot 11H_2O$)	58 and 59
Sodium Orthosilicate (Na_4SiO_4)	60
Trisodium Phosphate:	
Sampling	61
Trisodium Phosphate (Na_3PO_4) Content and Phosphorus Pentoxide (P_2O_5)	62-64
Trisodium Phosphate Calculated as $Na_3PO_4 \cdot 12H_2O$, $Na_3PO_4 \cdot H_2O$, Na_3PO_4, and as P_2O_5	65-68
Total Alkalinity as Sodium Oxide (Na_2O)	69-71
Matter Insoluble in Water	72 and 73
Tetrasodium Pyrophosphate:	
Sampling	74
Tetrasodium Pyrophosphate ($Na_4P_2O_7$)	75-79
Matter Insoluble in Water	80 and 81
Loss on Ignition	82 and 83
Borax:	
Sampling	84
Total Borate and Excess Alkalinity or Acidity	85-87
Matter Insoluble in Water	88 and 89
Sodium Triphosphate:	
Sampling	90
Tritratable Na_2O	91-94
Total P_2O_5:	
Preferred Method	95-97
Alternative Method	98-101
pH Titration	102-107
Quantitative Separation and Measurement of Various Phosphates:	
Reverse-Flow Ion-Exchange Chromatography (Preferred Method)	108-119
Paper Chromatographic Method	120-127
pH of 1 percent Solution	128
Turbidity	129
Temperature Rise	130-134
Sulfate	135-137
Ignition Loss	140 and 141
Matter Insoluble in Water	142-144
Particle Size	145
Orthophosphate	146-151

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.* Material Safety Data Sheets are available for reagents and materials. Review them for hazards prior to usage.

2. Referenced Documents

2.1 *ASTM Standards:* [2]

D 459 Terminology Relating to Soaps and Other Detergents

D 1193 Specification for Reagent Water

E 1 Specification for ASTM Thermometers

E 70 Test Method for pH of Aqueous Solutions with the Glass Electrode

[1] These test methods are under the jurisdiction of ASTM Committee D12 on Soaps and Other Detergents and are the direct responsibility of Subcommittee D12.12 on Analysis and Specifications of Soaps, Synthetics, Detergents and their Components.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For Annual Book of ASTM Standards volume information, refer to the standard's Document Summary page on the ASTM website.

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