TraceMetal Grade Acids and Base

Now packaged in Poly Bottles

Fisher Chemical high purity acids and bases have set the standard of excellence for demanding applications involving trace metal analysis in diverse fields such as environmental testing and electronics research. Popular instrument systems such as atomic absorption spectroscopy (AA) and inductively coupled plasma mass spectrometry (ICP-MS) require samples prepared with the the highest purity acids in order to carry out exacting measurements of trace metal content.

Selected Fisher Chemical TraceMetal Grade Acids and Bases are now available in *poly* bottles (Table 1). These bottles consist of a new high density polyethylene made with a proprietary resin that provides up to 80% less metallic extractables compared to glass. This new packaging material for TraceMetal Acids and Bases provides more convenience and stability during transport coupled with increased resistance to breakage compared to conventional glass packaging.

Tables 2 and 3 show trace metal content by ICP-MS in A509-P Nitric Acid and A508-P Hydrochloric Acid after one year of storage in a polyethylene bottle. The highlighted analytes demonstrate a reduction in the level of metallic extractables from polyethylene compared to glass.

KEY FEATURES

- Best acids available in the market due to low metallic extractables from the *poly* bottles (up to 80% less than glass bottles)
- Proprietary distillation techniques achieve metal concentrations in the sub-ppb range
- Expiration date listed on product label; A509P Nitric Acid has two year and all others three year expiration from date of manufacture
- Now sold as “each” quantity in a shelf-ready pack that can be directly shipped to end user

PACKAGING ADVANTAGES

- *Poly* bottles provide reduced weight for safer and easier handling in the laboratory and limited or no breakage during transportation
- FisherLOCK tamper evident cap for chemical safety and drip lip pour feature for safer pouring in the laboratory
- Fully recyclable package and *poly* bottle for reduced waste disposal
- *Poly* bottles take up less space than glass bottles, providing better chemical storage space utilization in the laboratory
- With the *poly* bottle there is no longer a need to remove the PVC coating on glass to allow for disposal in landfills or recycling glass

A508-P500 and A508-P212

TABLE 1. FISHER CHEMICAL TRACEMETAL GRADE ACIDS AND BASES PACKAGED IN NEW POLY BOTTLE

NEW PART NO. (POLYETHYLENE BOTTLE)	PRODUCT DESCRIPTION	PACK SIZE	CURRENT PART NO. (GLASS BOTTLE)	CURRENT PACK SIZE
A507-P500	Acetic Acid, TraceMetal Grade	500mL	**A507-500**	500mL
A507-P212		2.5L	**A507-212**	2.5L
			A507-SK212	2.5L Safe-Cote
A508-P500	Hydrochloric Acid, TraceMetal Grade	500mL	**A508-500**	500mL
A508-P212		2.5L	**A508-212**	2.5L
			A508-SK212	2.5L Safe-Cote
A509-P500	Nitric Acid, TraceMetal Grade	500mL	**A509-500**	500mL
A509-P212		2.5L	**A509-212**	2.5L
			A509-SK212	2.5L Safe-Cote
A510-P500	Sulfuric Acid, TraceMetal Grade	500mL	**A510-500**	500mL
A510-P212		2.5L	**A510-212**	2.5L
			A510-SK212	2.5L Safe-Cote
A511-P500	Perchloric Acid, TraceMetal Grade	500mL	**A511-500**	500mL
A511-P212		2.5L	**A511-212**	2.5L
			A511-SK212	2.5L Safe-Cote
A512-P500	Ammonium Hydroxide, TraceMetal Grade	500mL	**A512-500**	500mL

TABLE 2. TRACE IMPURITIES BY ICP-MS IN A509-P NITRIC ACID AFTER ONE YEAR STORAGE IN NEW POLYETHYLENE BOTTLE

PRODUCT CODE A509	MAX. SPEC.	TYPICAL VALUE*
Assay (HNO_3, w/w)	67 - 70%	69%
Color (APHA)	10	< 10
Analyte	**Trace Impurities (µg/g, ppm)**	
Chloride (Cl-)	0.2	< 0.2
Total Phosphorus (P)	0.01	< 0.01
Total Sulphur (S)	0.3	< 0.3
Analyte	**Trace Impurities (ng/g, ppb)**	
Aluminum (Al)	1	< 0.5
Antimony (Sb)	0.5	< 0.1
Arsenic (As)	0.5	< 0.1
Barium (Ba)	0.1	< 0.1
Beryllium (Be)	0.1	< 0.1
Bismuth (Bi)	0.1	< 0.1
Boron (B)	1	< 0.5
Cadmium (Cd)	0.5	< 0.1
Calcium (Ca)	1	< 0.5
Cerium (Ce)	0.1	< 0.1
Cesium (Cs)	0.1	< 0.1
Chromium (Cr)	1	< 0.5
Cobalt (Co)	0.5	< 0.1
Copper (Cu)	0.5	< 0.1
Dysprosium (Dy)	0.1	< 0.1
Erbium (Er)	0.1	< 0.1
Europium (Eu)	0.1	< 0.1

PRODUCT CODE A509	MAX. SPEC.	TYPICAL VALUE*
Gadolinium (Gd)	0.1	< 0.1
Gallium (Ga)	0.1	< 0.1
Germanium (Ge)	0.1	< 0.1
Gold (Au)	0.1	< 0.1
Hafnium (Hf)	0.1	< 0.1
Holmium (Ho)	0.1	< 0.1
Indium (In)	0.1	< 0.1
Iron (Fe)	1	< 0.5
Lanthanum (La)	0.1	< 0.1
Lead (Pb)	0.1	< 0.1
Lithium (Li)	0.1	< 0.1
Lutetium (Lu)	0.1	< 0.1
Magnesium (Mg)	1	< 0.1
Manganese (Mn)	0.1	< 0.1
Mercury (Hg)	0.1	< 0.1
Molybdenum (Mo)	0.1	< 0.1
Neodymium (Nd)	0.1	< 0.1
Nickel (Ni)	0.5	< 0.1
Niobium (Nb)	0.1	< 0.1
Palladium (Pd)	0.5	< 0.1
Platinum (Pt)	0.5	< 0.1
Potassium (K)	1	< 0.1
Praseodymium (Pr)	0.1	< 0.1
Rhenium (Re)	0.1	< 0.1

PRODUCT CODE A509	MAX. SPEC.	TYPICAL VALUE*
Rhodium (Rh)	0.5	< 0.1
Rubidium (Rb)	0.1	< 0.1
Ruthenium (Ru)	0.5	< 0.1
Samarium (Sm)	0.1	< 0.1
Scandium (Sc)	0.1	< 0.1
Selenium (Se)	1	< 0.5
Silver (Ag)	0.1	< 0.1
Sodium (Na)	1	< 1
Strontium (Sr)	0.1	< 0.1
Tantalum (Ta)	Information Only	< 0.1
Tellurium (Te)	0.1	< 0.1
Terbium (Tb)	0.1	< 0.1
Thallium (Tl)	0.1	< 0.1
Thorium (Th)	0.1	< 0.1
Thulium (Tm)	0.1	< 0.1
Tin (Sn)	0.5	< 0.1
Titanium (Ti)	0.5	< 0.1
Tungsten (W)	0.1	< 0.1
Uranium (U)	0.1	< 0.1
Vanadium (V)	0.5	< 0.1
Ytterbium (Yb)	0.1	< 0.1
Yttrium (Y)	0.1	< 0.1
Zinc (Zn)	0.5	< 0.1
Zirconium (Zr)	0.1	< 0.1

TABLE 3. TRACE IMPURITIES BY ICP-MS IN A508-P HYDROCHLORIC ACID AFTER ONE YEAR STORAGE IN NEW POLYETHYLENE BOTTLE

PRODUCT CODE A508	MAX. SPEC.	TYPICAL VALUE*
Assay (HCl, w/w):	34 - 37%	35%
Color (APHA)	10	< 10
Analyte	**Trace Impurities (µg/g, ppm)**	
Bromide (Br-)	10	< 10
Free Chlorine (Cl_2)	0.5	< 0.5
Total Phosphorus (P)	0.01	< 0.01
Total Sulphur (S)	0.3	< 0.3
Analyte	**Trace Impurities (ng/g, ppb)**	
Aluminum (Al)	1	< 0.5
Antimony (Sb)	0.5	< 0.1
Arsenic (As)	0.5	< 0.1
Barium (Ba)	0.1	< 0.1
Beryllium (Be)	0.1	< 0.1
Bismuth (Bi)	0.1	< 0.1
Boron (B)	1	< 0.5
Cadmium (Cd)	0.1	< 0.1
Calcium (Ca)	1	< 0.5
Cerium (Ce)	0.1	< 0.1
Cesium (Cs)	0.1	< 0.1
Chromium (Cr)	0.5	< 0.1
Cobalt (Co)	0.1	< 0.1
Copper (Cu)	0.5	< 0.1
Dysprosium (Dy)	0.1	< 0.1
Erbium (Er)	0.1	< 0.1
Europium (Eu)	0.1	< 0.1

PRODUCT CODE A508	MAX. SPEC.	TYPICAL VALUE*
Gadolinium (Gd)	0.1	< 0.1
Gallium (Ga)	0.1	< 0.1
Germanium (Ge)		<
Gold (Au)	0.5	< 0.1
Hafnium (Hf)	0.1	< 0.1
Holmium (Ho)	0.1	< 0.1
Indium (In)	0.1	< 0.1
Iron (Fe)	1	< 0.5
Lanthanum (La)	0.1	< 0.1
Lead (Pb)	0.1	< 0.1
Lithium (Li)	0.1	< 0.1
Lutetium (Lu)	0.1	< 0.1
Magnesium (Mg)	0.5	< 0.1
Manganese (Mn)	0.1	< 0.1
Mercury (Hg)	0.1	< 0.1
Molybdenum (Mo)	0.1	< 0.1
Neodymium (Nd)	0.1	< 0.1
Nickel (Ni)	0.5	< 0.1
Niobium (Nb)	0.1	< 0.1
Palladium (Pd)	Information Only	< 0.1
Platinum (Pt)	Information Only	< 0.1
Potassium (K)	1	< 0.1
Praseodymium (Pr)	0.1	< 0.1
Rhenium (Re)	0.1	< 0.1
Rhodium (Rh)	0.1	< 0.1

PRODUCT CODE A508	MAX. SPEC.	TYPICAL VALUE*
Rubidium (Rb)	0.1	< 0.1
Ruthenium (Ru)	0.1	< 0.1
Samarium (Sm)	0.1	< 0.1
Scandium (Sc)	0.1	< 0.1
Selenium (Se)	1	< 0.5
Silver (Ag)	1	< 0.1
Sodium (Na)	1	< 1
Strontium (Sr)	0.1	< 0.1
Tantalum (Ta)	Information Only	< 0.1
Tellurium (Te)	0.1	< 0.1
Terbium (Tb)	0.1	< 0.1
Thallium (Tl)	0.1	< 0.1
Thorium (Th)	0.1	< 0.1
Thulium (Tm)	0.1	< 0.1
Tin (Sn)	0.5	< 0.1
Titanium (Ti)	0.5	< 0.1
Tungsten (W)	0.1	< 0.1
Uranium (U)	0.1	< 0.1
Vanadium (V)	0.5	< 0.1
Ytterbium (Yb)	0.1	< 0.1
Yttrium (Y)	0.1	< 0.1
Zinc (Zn)	1	< 0.1
Zirconium (Zr)	0.1	< 0.1

**One Year Storage in Polyethylene*

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