CERTIFICATE OF ANALYSIS BASELINE[®] Ammonia Solution

ASCAV (NHa w/w)

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2A	Mastala			haa hiinka aa a		MO			The		3A	4A	5A	6A	7A	
4 Be < 0.01	average evaporat	of three ali ed to dryne	quots subsa ss. The rest	ampled fron ulting residu	n three sam e is reconst	ples repres	sentative of mall volume	the lot. The of <mark>SEAST</mark> A	e samples a ∖R [™] BASEL	are slowly .INE [®] 2%						
12 Mg < 1	For volat below 3 t	ile elements imes the sta	s (indicated indard devia	by *), the ac ation of the b	id samples lank are sho	are diluted t	hen directly	injected inte	o the ICP-M cted.	IS. Values	13 AI < 5					
20 Ca < 5				24 Cr	25 Mn	26 Fe < 1					31 G a < 0.01	<mark>32 Ge</mark> < 0.01	33 As < 0.01	34 Se < 5		
38 Sr < 0.01	39 Y < 0.01	40 Zr < 0.01	41 Nb < 0.01	42 Mo < 0.05		44 Ru < 0.01	45 Rh < 0.01	46 Pd < 0.1	47 Ag < 0.01	48 Cd < 0.01	<mark>49 In</mark> < 0.01	50 Sn < 0.05	51 Sb < 0.01	52 Te < 0.01		
56 Ba < 0.05	57 La < 0.01	72 Hf < 0.01	73 Ta	74 W < 0.05	75 Re < 0.01			78 Pt < 0.1	79 Au < 0.1	80 Hg < 50	<mark>81 TI</mark> < 0.01	82 Pb < 0.5	83 Bi < 0.01			
	< 0.01 12 Mg < 1 20 Ca < 5 38 Sr < 0.01 56 Ba	4 Be Invost ele average < 0.01	4 Be < 0.01	4Be average of three aliquots subst evaporated to dryness. The rest Nitric Acid / 2% Hydrogen Perox12Mg < 1 For volatile elements (indicated below 3 times the standard devia $3B$ 20Ca21Sc22Ti23V < 5 < 0.01 < 1 < 1 < 1 38Sr39Y40Zr41Nb < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 56Ba57La72Hf73Ta	4Be < 0.01Most elements are determined by high res average of three aliquots subsampled from evaporated to dryness. The resulting residu Nitric Acid / 2% Hydrogen Peroxide. Operati For volatile elements (indicated by *), the aci below 3 times the standard deviation of the bi 3B12Mg < 1For volatile elements (indicated by *), the aci below 3 times the standard deviation of the bi 3B20Ca < 521Sc22Ti < 123V24Cr < 0.0538Sr39Y40Zr41Nb42Mo < 0.01	4Be average of three aliquots subsampled from three same evaporated to dryness. The resulting residue is reconst Nitric Acid / 2% Hydrogen Peroxide. Operations are con For volatile elements (indicated by *), the acid samples and below 3 times the standard deviation of the blank are shown ar	4 Be < 0.01	4Be average of three aliquots subsampled from three samples representative of evaporated to dryness. The resulting residue is reconstituted in a small volume Nitric Acid / 2% Hydrogen Peroxide. Operations are conducted under Class 10012Mg evaporated to dryness. The resulting residue is reconstituted in a small volume Nitric Acid / 2% Hydrogen Peroxide. Operations are conducted under Class 10012Mg evaporated to dryness. The resulting residue is reconstituted in a small volume Nitric Acid / 2% Hydrogen Peroxide. Operations are conducted under Class 10012Mg evaporated to dryness. The resulting residue is reconstituted in a small volume Nitric Acid / 2% Hydrogen Peroxide. Operations are conducted under Class 10012Mg evaporated to dryness. The resulting residue is reconstituted in a small volume Nitric Acid / 2% Hydrogen Peroxide. Operations are conducted under Class 10012Mg evaporated to dryness. The resulting residue is reconstituted in a small volume Nitric Acid / 2% Hydrogen Peroxide. Operations are conducted under Class 10012Mg evaporated to dryness. The resulting residue is reconstituted in a small volume Nitric Acid / 2% Hydrogen Peroxide. Operations are conducted under Class 10012Mg evaporated to dryness. The resulting residue is reconstituted in a small volume State of the blank are shown with '<', no blank value 3B20Ca21Sc22Ti23V24Cr25Mn26Fe27Co38Sr39Y40Zr41Nb42Mo44Ru45Rh< 0.01< 0.01< 0.01< 0.05 <td>4 Be < 0.01</td> average of three aliquots subsampled from three samples representative of the lot. The evaporated to dryness. The resulting residue is reconstituted in a small volume of SEASTA Nitric Acid / 2% Hydrogen Peroxide. Operations are conducted under Class 100 or better clast for volatile elements (indicated by *), the acid samples are diluted then directly injected into below 3 times the standard deviation of the blank are shown with '<', no blank value is subtract 3B	4 Be < 0.01	4Be < 0.01 Not elements are determined by high resolution for the samples representative of the lot. The samples average of three aliquots subsampled from three samples representative of the lot. The samples are evaporated to dryness. The resulting residue is reconstituted in a small volume of SEASTAR TM BASEL Nitric Acid / 2% Hydrogen Peroxide. Operations are conducted under Class 100 or better clean-room c For volatile elements (indicated by *), the acid samples are diluted then directly injected into the ICP-M below 3 times the standard deviation of the blank are shown with '<', no blank value is subtracted. 3B4B5B6B7B81B20Ca21Sc22Ti23V24Cr25Mn26Fe27Co28Ni29Cu < 5 < 0.01 < 1 < 1 < 0.05 < 0.1 < 1 < 0.05 < 0.05 < 0.05 < 0.5 < 0.5 38Sr39Y40Zr41Nb42Mo < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.0	4Be < 0.01Wost elements are determined by high resolution ICP-MS dsing sample preconcentration. The results are an average of three aliquots subsampled from three samples representative of the lot. The samples are slowly evaporated to dryness. The resulting residue is reconstituted in a small volume of SEASTAR [™] BASELINE [®] 2% Nitric Acid / 2% Hydrogen Peroxide. Operations are conducted under Class 100 or better clean-room conditions.12Mg < 1For volatile elements (indicated by *), the acid samples are diluted then directly injected into the ICP-MS. Values below 3 times the standard deviation of the blank are shown with '<', no blank value is subtracted.B2B20Ca21Sc22Ti23V24Cr25Mn26Fe27Co28Ni29Cu30Zn< 5	4Be average of three aliquots subsampled from three samples representative of the lot. The samples are slowly evaporated to dryness. The resulting residue is reconstituted in a small volume of SEASTAR TM BASELINE [®] 2% Nitric Acid / 2% Hydrogen Peroxide. Operations are conducted under Class 100 or better clean-room conditions.13AI12Mg < 1	4Be average of three aliquots are determined by high resolution hor -wis using sample preconcentration. The results are and average of three aliquots subsampled from three samples representative of the lot. The samples are slowly evaporated to dryness. The resulting residue is reconstituted in a small volume of SEASTAR [™] BASELINE [®] 2%. Nitric Acid / 2% Hydrogen Peroxide. Operations are conducted under Class 100 or better clean-room conditions.13AI a12Mg evaporated to dryness. The resulting residue is reconstituted in a small volume of SEASTAR [™] BASELINE [®] 2%. Nitric Acid / 2% Hydrogen Peroxide. Operations are conducted under Class 100 or better clean-room conditions.13AI a20Ca21Sc22Ti23V24Cr25Mn26Fe27Co28Ni29Cu30Zn31Ga32Ge20Ca21Sc22Ti23V24Cr25Mn26Fe27Co28Ni29Cu30Zn31Ga32Ge38Sr39Y40Zr41Nb42Mo44Ru45Rh46Pd47Ag48Cd49In50Sn< 0.01	4Be average of three aliquots subsampled from three solution for three samples representative of the lot. The samples are slowly evaporated to dryness. The resulting residue is reconstituted in a small volume of SEASTAR THE BASELINE ($^{\circ}$ 2% Nitric Acid / 2% Hydrogen Peroxide. Operations are conducted under Class 100 or better clean-room conditions. For volatile elements (indicated by *), the acid samples are diluted then directly injected into the ICP-MS. Values below 3 times the standard deviation of the blank are shown with '<', no blank value is subtracted.13Al < 520Ca21Sc22Ti23V24Cr25Mn26Fe27Co28Ni29Cu30Zn31Ga32Ge33As< 5	4Be average of three aliquots subsampled from three samples representative of the lot. The samples are slowly evaporated to dryness. The resulting residue is reconstituted in a small volume of SEASTAR [™] BASELINE [®] 2% Nitric Acid / 2% Hydrogen Peroxide. Operations are conducted under Class 100 or better clean-room conditions.13AI < 512Mg e < 1	4Be average of three aliquots subsampled from three samples representative of the lot. The samples are slowly evaporated to dryness. The resulting residue is reconstituted in a small volume of SEASTAR [™] BASELINE [®] 2% Nitric Acid / 2% Hydrogen Peroxide. Operations are conducted under Class 100 or better clean-room conditions.13AI < 512Mg evaporated to dryness. The resulting residue is reconstituted in a small volume of SEASTAR [™] BASELINE [®] 2% Nitric Acid / 2% Hydrogen Peroxide. Operations are conducted under Class 100 or better clean-room conditions.13AI < 520Ca21Sc22Ti23V24Cr25Mn26Fe27Co28Ni29Cu30Zn31Ga32Ge33As34Se20Ca21Sc22Ti23V24Cr25Mn26Fe27Co28Ni29Cu30Zn31Ga32Ge33As34Se< 5

LOT NUMBED: 721/070

ALL VALUES ARE REPORTED IN PARTS PER TRILLION (PPT)

KEY	(1) Atomic Number	58 Ce	59 Pr	60 Nd	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu
	(2) Elemental Symbol(3) Concentration (mean	< 0.01	< 0.05	< 0.5	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
	in ppt)	90 Th		92 U			_							
	(4) 1 Standard Deviation (N=3)	< 0.01		< 0.01				E						
	()													

<u>NH₃ (20 - 22%): Properties</u> Molar Mass: 17.03g/mol Density: 0.92 g/ml Molarity: 11 moles/litre Normality: 11 moles/litre

DDODUCT NUMBED: \$020704

BASELINE

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Release Date: September 23, 2014 Expiry Date: September 23, 2017

SEASTAR CHEMICALS INC

Dr. B. McKelvey QA/QC Manager



Product Integrity:

Based on extensive testing results, SEASTAR CHEMICALS INC have found our products, unopened and sealed, maintain the certified integrity, or product quality, for a minimum of three years under the following conditions:

- Stored at room temperature, maximum range 15°C (59°F) to 25°C (77°F).
- Minimum exposure to light.
- For limited time, storage/transport temperature range 5°C (41°F) to 35°C (95°F)

Upon opening the product, the product's integrity will depend on proper handling and exposure to contaminants. The product has been bottled under CLASS 100 clean room conditions, to maintain the certified quality it should be used under these conditions. Furthermore to reduce trace metal contamination, the inner pack of plastic bags and bottle should be opened under CLASS 100 particle conditions to maintain the integrity of the product. The use of plastic gloves, hair net and a clean room suit is also advised.

Safety:

PRIOR to opening or storing this product be sure to consult the Material Safety Data Sheet (MSDS) Section 7 Handling and Storage to ensure safe storage and handling with regards to this hazardous material. This information must be understood prior to its use or storage.

SAFETY HANDLING NOTES: Consult your MSDS, PRIOR to handling these materials. Use proper safety apparel according to the recommendations of the MSDS. Exposure controls and personal protection should include: a properly functioning fume hood, protection for eyes (safety glasses), hands (chemically compatible gloves), feet (chemically compatible boots) and exposed skin (splash protection and a chemically compatible apron). All of these items must conform to local/regional/national regulatory requirements.

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