## CERTIFICATE OF ANALYSIS

# **BASELINE®** Ammonia Solution

	PRODU	JCT NU	MBER:	S02070	)1	LOT N	IUMBEI	R: 7216	040	AS	SAY (NI	13, w/w	): 20%	, 0		
_	average evaporate Nitric Acid For volati	of three ali ed to dryne d / 2% Hydr le elements	quots subs ss. The resi ogen Perox s (indicated	ampled fron ulting residu ide. Operati by *), the ac	n three sam e is reconst ons are con id samples	nples repres ituted in a s ducted und are diluted t	sentative of mall volume er Class 100 hen directly	the lot. The of SEASTA or better cl injected int	e samples a AR™ BASEL ean-room c o the ICP-M	are slowly INE® 2% onditions.	3A 13 AI	4A	5A	6A	7A	
< 0.5	3B	4B	5B	6B	7B	, ,	8	uc is subtra	1B	2B	< 10					
<b>20</b> Ca < 10	<b>21 Sc</b> < 0.01	<b>22</b> Ti < 0.5	<b>23 V</b> < 0.5	<b>24</b> Cr < 0.2					29 Cu < 0.5	30 Zn < 1	<b>31 G</b> a < 0.01	<b>32 G</b> e < 0.01	<b>33 As</b> < 0.5	34 Se < 1		
<b>38</b> Sr < 0.05	<b>39 Y</b> < 0.01	<b>40 Z</b> r < 0.01	<b>41 Nb</b> < 0.01	<b>42 Mo</b> < 0.02		<b>44 Ru</b> < 0.01	<b>45</b> Rh < 0.01	<b>46</b> Pd < 0.1	<b>47 Ag</b> < 0.01	<b>48 Cd</b> < 0.02	<b>49</b> In < 0.01	<b>50</b> Sn < 0.05	<b>51 Sb</b> < 0.01	<b>52 Te</b> < 0.05		
<b>56 Ba</b> < 0.05	<b>57</b> La < 0.01	<b>72 Hf</b> < 0.1	73 Ta	<b>74 W</b> < 0.1	<b>75</b> Re < 0.01			<b>78 Pt</b> < 0.1	<b>79</b> Au < 0.5	<b>80</b> Hg < 200	<b>81 TI</b> < 0.01	<b>82 Pb</b> < 0.02	<b>83 B</b> i < 0.01			
	4 Be < 0.05  12 Mg < 0.5  20 Ca < 10  38 Sr < 0.05	2A Most eler average evaporate Nitric Acid For volating below 3 to 3B  20 Ca 21 Sc < 10 < 0.01  38 Sr 39 Y < 0.05  56 Ba 57 La	2A  4 Be average of three ali evaporated to dryne Nitric Acid / 2% Hydr For volatile elements below 3 times the state 3B  20 Ca 21 Sc 22 Ti < 10 < 0.01 < 0.5  38 Sr 39 Y 40 Zr < 0.05 < 0.01 < 0.01  56 Ba 57 La 72 Hf	2A  4 Be average of three aliquots subsequated to dryness. The resultince Acid / 2% Hydrogen Peroxember 50.5  12 Mg For volatile elements (indicated below 3 times the standard deviation 3B 4B 5B  20 Ca 21 Sc 22 Ti 23 V < 10 < 0.01 < 0.5  38 Sr 39 Y 40 Zr 41 Nb < 0.05 < 0.01 < 0.01 < 0.01  56 Ba 57 La 72 Hf 73 Ta	2A  4 Be average of three aliquots subsampled from evaporated to dryness. The resulting residu Nitric Acid / 2% Hydrogen Peroxide. Operating For volatile elements (indicated by *), the acid below 3 times the standard deviation of the back of the standard devia	4 Be average of three aliquots subsampled from three same evaporated to dryness. The resulting residue is reconst Nitric Acid / 2% Hydrogen Peroxide. Operations are const Nitric Acid / 2% Hydrogen Peroxide. Operations are const Selow 3 times the standard deviation of the blank are shown as the standard deviation of the blank are	Most elements are determined by high resolution ICP-MS using saverage of three aliquots subsampled from three samples represe evaporated to dryness. The resulting residue is reconstituted in a saverage of three aliquots subsampled from three samples represe evaporated to dryness. The resulting residue is reconstituted in a saverage of three aliquots subsampled from three samples represe evaporated to dryness. 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The samples representative of	Most elements are determined by high resolution ICP-MS using 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. 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.  3B 4B 5B 6B 7B 8 1B 2B  20 Ca 21 Sc 22 Ti 23 V 24 Cr 25 Mn 26 Fe 27 Co 28 Ni 29 Cu 30 Zn < 10 < 0.01 < 0.01 < 0.5 < 0.5 < 0.2 < 0.02 < 0.5 < 0.02 < 2 < 0.5 < 1  38 Sr 39 Y 40 Zr 41 Nb 42 Mo < 44 Ru 45 Rh 46 Pd 47 Ag 48 Cd < 0.05 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.02  56 Ba 57 La 72 Hf 73 Ta 74 W 75 Re 78 Pt 79 Au 80 Hg	A Most elements are determined by high resolution ICP-MS using 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. For volatile elements (indicated by *), the acid samples are diluted then directly injected into the ICP-MS. 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Operations are conducted under Class 100 or better clean-room conditions.  12 Mg   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.  3B 4B 5B 6B 7B 8 1B 2B  20 Ca 21 Sc 22 Ti 23 V 24 Cr 25 Mn 26 Fe 27 Co 28 Ni 29 Cu 30 Zn 31 Ga 32 Ge 4 10 < 0.01 < 0.5 < 0.5 < 0.5 < 0.2 < 0.02 < 0.5 < 0.02 < 2 < 0.5 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.05 Sn < 0.05 < 0.01 < 0.01 < 0.01 < 0.01 < 0.05 Sn < 0.05 Sn < 0.01 < 0.01 < 0.01 < 0.01 < 0.01 < 0.05 Sn	A Be < 0.05  Whitric Acid / 2% Hydrogen Peroxide. Operations are conducted under Class 100 or better clean-room conditions. For volatile elements (indicated by *), the acid samples are slown with '<', no blank value is subtracted.  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#### ALL VALUES ARE REPORTED IN PARTS PER TRILLION (PPT)

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(3)	(						
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(/)							

(1) Atomic Number

(2) Elemental Symbol

(3) Concentration (mean in ppt)

(4) 1 Standard Deviation (N=3)

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
< 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
90 Th		92 U										
< 0.01	Ł.	< 0.01										
	*											



NH<sub>3</sub> (20 - 22%): Properties

Molar Mass: 17.03g/mol

Density: 0.92 g/ml

Molarity: 11 moles/litre

Normality: 11 moles/litre

Release Date:

May 05, 2016

**Expiry Date:** 

May 05, 2019

Greg Henson QA & RA 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.

Greg Henson

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QA & RA Manager

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