CERTIFICATE OF ANALYSIS

BASELINE® Hydrobromic Acid

PRODUC	CT NUM	BER: S	020801	ı	OT NU	MBER:	82170	10	Į.	ASSAY ((HBr, w	/w): 48°	%	[
Be average evapora	of three ali ted to dryne	quots subs	ampled fron Iting residue	n three san e is reconstit	nples repres tuted in a sm	sentative of nall volume	the lot. The of 2% SEAS	e samples a TAR [™] BAS	are slowly SELINE®	3A 5 B < 1000	4A	5A	6A	7A	
	ues below 3 t 4B	imes the sta 5B	andard devia	ation of the b	olank are sho	own with "<" 8	, no blank va	llue is subtra	acted. 2B	13 AI < 5					
	22 Ti < 0.2	23 V < 0.01	24 Cr < 0.5	25 M n < 0.2	26 Fe < 10	27 C o < 0.02	28 Ni < 5	29 C u < 0.5	30 Zn < 1	31 Ga < 0.01					
	40 Z r < 0.02	41 Nb < 0.05	42 M o		44 Ru < 0.01	45 Rh < 0.01	46 Pd < 1	47 Ag < 0.05	48 Cd < 0.5	49 In < 0.01	50 Sn < 2	51 Sb < 1	52 Te < 0.02		ж.
).	Most eleaverage evapora Nitric Ac MS. Valu 3B Ca 21 Sc < 0.01 Sr 39 Y 0.1	Most elements are caverage of three alievaporated to dryne Nitric Acid. For volat MS. Values below 31 3B 4B Ca 21 Sc 22 Ti < 0.01 < 0.2 Sr 39 Y 40 Zr < 0.01 < 0.02 Ba 57 La 72 Hf	Most elements are determined average of three aliquots subsequence evaporated to dryness, the resunstriction of the state	average of three aliquots subsampled from evaporated to dryness, the resulting residue Nitric Acid. For volatile elements (indicated MS. Values below 3 times the standard deviation of the standard dev	Most elements are determined by magnetic sector ICP average of three aliquots subsampled from three san evaporated to dryness, the resulting residue is reconstituing. Nitric Acid. For volatile elements (indicated by *), the acid. Ms. Values below 3 times the standard deviation of the base of the s	Most elements are determined by magnetic sector ICP-MS using saverage of three aliquots subsampled from three samples represe evaporated to dryness, the resulting residue is reconstituted in a sm. Nitric Acid. For volatile elements (indicated by *), the acid samples MS. Values below 3 times the standard deviation of the blank are shown as the standard deviation of the sta	Most elements are determined by magnetic sector ICP-MS using sample pre average of three aliquots subsampled from three samples representative of evaporated to dryness, the resulting residue is reconstituted in a small volume Nitric Acid. For volatile elements (indicated by *), the acid samples are diluted to MS. Values below 3 times the standard deviation of the blank are shown with "<" 3B 4B 5B 6B 7B 8 Ca 21 Sc 22 Ti 23 V 24 Cr 25 Mn 26 Fe 27 Co < 0.01 < 0.01 < 0.02 Sr 39 Y 40 Zr 41 Nb 42 Mo 44 Ru 45 Rh < 0.01 < 0.01 < 0.02 Sr 39 Y 40 Zr 41 Nb 42 Mo 44 Ru 45 Rh < 0.01 < 0.01 < 0.01	Most elements are determined by magnetic sector ICP-MS using sample preconcentration 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 2% SEAS Nitric Acid. For volatile elements (indicated by *), the acid samples are diluted then directly MS. Values below 3 times the standard deviation of the blank are shown with "<", no blank values are shown with "<", no blank values below 3 times the standard deviation of the blank are shown with "<", no blank values are shown with "<", no blank	Most elements are determined by magnetic sector ICP-MS using sample preconcentration. The rest average of three aliquots subsampled from three 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 2% SEASTAR [™] BAS Nitric Acid. For volatile elements (indicated by *), the acid samples are diluted then directly injected into MS. Values below 3 times the standard deviation of the blank are shown with "<", no blank value is subtracted by the sample of the plank are shown with "<", no blank value is subtracted by the sample of the plank are shown with "<", no blank value is subtracted by the plank are shown with "<", no blank value is subtracted by the plank are shown with "<", no blank value is subtracted by the plank are shown with "<", no blank value is subtracted by the plank are shown with "<", no blank value is subtracted by the plank are shown with "<", no blank value is subtracted by the plank are shown with "<", no blank value is subtracted by the plank are shown with "<", no blank value is subtracted by the plank are shown with "<", no blank value is subtracted by the plank are shown with "<", no blank value is subtracted by the plank are shown with "<", no blank value is subtracted by the plank are shown with "<", no blank value is subtracted by the plank are shown with "<", no blank value is subtracted by the plank are shown with "<", no blank value is subtracted by the plank are shown with "<", no blank value is subtracted by the plank are shown with "<", no blank value is subtracted by the plank are shown with "<", no blank value is subtracted by the plank are shown with "<", no blank value is subtracted by the plank are shown with "<", no blank value is subtracted by the plank are shown with "<", no blank value is subtracted by the plank are shown with "<", no blank value is subtracted by the plank are shown with "<", no blank va	Most elements are determined by magnetic sector ICP-MS using sample preconcentration. 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Values below 3 times the standard deviation of the blank are shown with "<", no blank value is subtracted. 3A 4A 5A 5 B < 1000 13 AI < 5 13 AI < 5 14 Se 1000 13 AI < 5 15 Se < 1000 10 AI < 5 10 AI < 6 < 6 10 AI < 7 < 7 < 7 < 7 < 8	Most elements are determined by magnetic sector 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 2% SEASTAR™ BASELINE® Nitric Acid. 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. 13 Al < 5 B	Most elements are determined by magnetic sector ICP-MS using sample preconcentration. The results are an average of three aliquots subsampled from three samples representative of the lot. 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ALL VALUES ARE REPORTED IN PARTS PER TRILLION (PPT)

(1) (2) (3) (4)

(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
'														
n	90 Th		92 U											
	< 0.01		< 0.01	317										



HBr (44 - 49%): Properties

Molar Mass: 80.91g/mol

Density: 1.5 g/ml

Molarity: 9 moles/litre

Normality: 9 moles/litre

Greg Henso

Release Date: August 10, 2017 Expiry Date: August 10, 2020







SEASTAR™'s Product Integrity Guidelines:

We have found our products, unopened and sealed, maintain the certified integrity, or product quality, for their stated certification period under the following conditions:

- Store at room temperature, maximum range 15°C (59°F) to 25°C (77°F).
- Avoid exposure to sunlight or ultraviolet light sources.
- Open in a 'particle free' environment. SEASTAR recommends a HEPA or ULPA particle filtered trace metal clean room. Open product should be handled under Class 100 or ISO 5 clean room or better conditions.

Once opened, product integrity will depend on proper handling and exposure to contaminants. To reduce trace metal contamination, the inner pack of plastic bags and bottle should be opened under Class 100 or ISO 5 clean room or better conditions to maintain the integrity of the product. The use of plastic gloves, hair net and a clean room suit is also advised.

Safety Guidelines:

PRIOR to opening or storing this product be sure to consult the Safety Data Sheet (SDS) to ensure safe storage and handling with regards to this hazardous material. This information must be read and understood prior to use or storage.

SAFETY HANDLING NOTES: Consult the SDS PRIOR to handling this product. Use proper safety apparel according to the recommendations of the SDS. 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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