

Speciation Standard

**Selenium (Se<sup>+6</sup>)**

Product #: VHG-SPSE6-4X25

Matrix: H<sub>2</sub>O

Lot #: 409-0123R-12

Species	Certified Concentration and Uncertainty	
Se <sup>(+6)</sup>	<b>86.8 µg/mL</b>	+/-1.0% relative

Element	Certified Concentration and Uncertainty	
Se	<b>100 µg/mL</b>	+/-1.0% relative

This solution is intended for use as a calibration or reference standard for plasma emission spectroscopy (ICP or DCP), inductively coupled plasma mass spectroscopy (ICP-MS), atomic absorption spectroscopy (AA or GFAA) or techniques using other modes of elemental detection and an appropriate separation method.

**Certification:** VHG standards are manufactured and certified under a quality control system that is accredited to both **ISO 9001** and **ISO/IEC 17025**. This standard was prepared to a nominal concentration of 100 µg/mL of total selenium using high purity raw materials dissolved and diluted with filtered (0.22µm), 18 M-ohm deionized water. The certified concentration value is based upon the analysis by IC-ICPMS. The uncertainty associated with the certified concentration is +/- 1.0% relative, which is the sum of the estimated errors due to purity of the raw material, gravimetric measurements and transpiration through the container wall. Secondary verification of the certified elemental concentration was done using plasma emission spectrometry (ICP-AES) and is traceable to NIST SRM 3149.

**Tools:** The balances used in the preparation of VHG CRMs are calibrated regularly with traceability to NIST. All volumetric dilutions are performed in class A glassware which is recalibrated regularly according to NIST recommended procedures. Measurement of standard preparation temperature was done using a calibrated thermometer maintained under internal procedure 4.11-A.

**Recommendations:** VHG guarantees the accuracy of this solution for **12 Months** from the certification date shown below, provided it is kept tightly capped and stored under normal laboratory conditions. We recommend that the analyst: (1) mix the solution by gentle shaking immediately prior to use, (2) use only pre-cleaned containers and transfer-ware, (3) make volumetric dilutions using certified class A flasks and pipettes, and, (4) dilute with the same matrix as the original standard.

VHG Labs, Inc.



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QA Manager

See Exp. date on container  
**Certification Date**

VHG Labs, Inc. waives all responsibility for any damages resulting from the usage and/or implementation of the products/data described herein.

VHG Standards are Traceable to the Following NIST SRMs:

Analyte	Aq. SRM	MO SRM		Analyte	Aq. SRM	MO SRM		Analyte	Aq. SRM	MO SRM
Ag	3151	1077a		Hf	3122	—		S	3154	2770
Al	3101a	1075a		Hg	3133	3133		Sb	3102a	3102a
As	3103a	3103a		Ho	3123a	—		Sc	3148a	3148a
Au	3121	—		In	3124a	3124a		Se	3149	3149
B	3107	3107		K	3141a	3141a		Si	3150	1066a
Ba	3104a	1051b		La	3127a	3127a		Sm	3147a	—
Be	3105a	3105a		Li	3129a	3129a		Sn	3161a	1057b
Bi	3106	3106		Lu	3130a	—		SO <sub>4</sub> <sup>-2</sup>	3181	—
Br	3184	—		Mg	3131a	3131a		Sr	3153a	3153a
Ca	3109a	3109a		Mn	3132	3132		Ta	3155	—
Cd	3108	1053a		Mo	3134	3134		Tb	3157a	—
Ce	3110	3110		Na	3152a	1069b		Te	3156	—
Cl	3182	1818a		Nb	3137	—		Th	3159	—
Co	3113	3113		Nd	3135a	—		Ti	3162a	3162a
Cr	3112a	1078b		Ni	3136	1065b		Tl	3158	3158
Cs	3111a	—		NO <sub>3</sub> <sup>-</sup>	3185	—		Tm	3160a	—
Cu	3114	1080a		P	3139a	3139a		U	3164	—
Dy	3115a	—		Pb	3128	1059c		V	3165	1052b
Er	3116a	—		Pd	3138	—		W	3163	3163
Eu	3117a	—		PO <sub>4</sub> <sup>-3</sup>	3186	—		Y	3167a	3167a
F	3183	—		Pr	3142a	—		Yb	3166a	—
Fe	3126a	1079b		Pt	3140	3140		Zn	3168a	3168a
Ga	3119a	—		Rb	3145a	—		Zr	3169	3169
Gd	3118a	—		Re	3143	—				
Ge	3120a	—		Rh	3144	3144				