Summary of certified values for

olive leaves   BCR CRM No. 62

Element	Certified value µg / g	95 % Confidence interval µg / g
Cd	0.10	± 0.02
Cu	46.6	± 1.80
Hg	0.28	± 0.02
Mn	57.0	± 2.40
Pb	25.0	± 1.50
Zn	16.0	± 0.70

Amount of Be ( ) (ng)	Absorbance
0	0
0.100	0.0242
0.200	0.0479
0.300	0.0725
0.400	0.0941
0.500	0.1187
0.600	0.1465
0.700	0.1652
0.800	0.1881
Calibration graph	$y = 0.236\ x\quad 6.88 \times 10^{-4}$
Correlation coefficient	$r = 0.9996$

2

Amount of Be ( ) (ng)	Absorbance
0	0
0.100	0.0236
0.200	0.0471
0.300	0.0704
0.400	0.0964
0.500	0.1185
0.600	0.1366
0.700	0.1632
0.800	0.1864

Calibration graph $y = 0.232 x \quad 8.42 \times 10^{-4}$

Correlation coefficient $r = 0.9992$

Amount of Be ( ) (ng)	Absorbance
0	0
0.100	0.0246
0.200	0.0494
0.300	0.0724
0.400	0.0941
0.500	0.1186
0.600	0.1424
0.700	0.1660
0.800	0.1896

Calibration graph $\qquad$ $y = 0.236\,x\quad 8.43\times10^{-4}$

Correlation coefficient $\qquad$ $r = 0.9999$

BCR No. 62　Trial #1

Amount of Be(　) spiked (ng)	Abs. (1+1)*	Abs. (×2)	Net Abs.
Blank	0.0161	0.0322	0
0	0.0399	0.0798	0.0476
0.100	0.0523	0.1046	0.0724
0.200	0.0628	0.1255	0.0933
0.300	0.0756	0.1512	0.1190

* A mixture of 500 μL cartridge 1 and 500 μL cartridge 2.

Calibration graph　　　　　　$y = 0.235 x$　0.0478

Correlation coefficient　　　　$r = 0.9993$

Amount of Be in the sample　　Let $y = 0$?　$x = 0.203$ (ng) Be^{2+}

BCR No. 62　Trial #2

Amount of Be(　) spiked (ng)	Abs. (1+1)*	Abs. (×2)	Net Abs.
Blank	0.0595	0.1190	0
0	0.0842	0.1684	0.0494
0.100	0.0954	0.1908	0.0718
0.200	0.1071	0.2142	0.0952
0.300	0.1207	0.2413	0.1223

*A mixture of 500 μL cartridge 1 and 500 μL cartridge 2.

Calibration graph　　　　　　$y = 0.242 x$　0.0484

Correlation coefficient　　　　$r = 0.9990$

Amount of Be in the sample　　Let $y = 0$?　$x = 0.200$ (ng) Be^{2+}

BCR No. 62 Trial #3

Amount of Be( ) spiked (ng)	Abs. (1+1)*	Abs. (×2)	Net Abs.
Blank	0.0211	0.0422	0
0	0.0421	0.0904	0.0482
0.100	0.0571	0.1142	0.0720
0.200	0.0684	0.1367	0.0945
0.300	0.0803	0.1606	0.1184

*A mixture of 500 μL cartridge 1 and 500 μL cartridge 2.

Calibration graph $y = 0.233 x   0.0483$

Correlation coefficient $r = 0.9999$

Amount of Be in the sample   Let $y = 0$? $x = 0.207$ (ng) Be^{2+}

Trial #1

Amount of Be( ) spiked (ng)	Abs. (1+1)*	Abs. (×2)	Net Abs.
Blank	0.0116	0.0232	0
0	0.0263	0.0525	0.0293
0.100	0.0379	0.0758	0.0526
0.200	0.0503	0.1005	0.0773

*A mixture of 500 μL cartridge 1 and 500 μL cartridge 2.

Calibration graph $y = 0.240 x   0.0291$

Correlation coefficient $r = 0.9999$

Amount of Be in the sample   Let $y = 0$? $x = 0.121$ (ng) Be^{2+}

Trial #2

Amount of Be( ) added (ng)	Abs. (1:1 combine)	Abs. (×2)	Net Abs.
Blank	0.0068	0.0135	0
0	0.0199	0.0398	0.0263
0.100	0.0319	0.0638	0.0503
0.200	0.0436	0.0871	0.0736

*A mixture of 500 μL cartridge 1 and 500 μL cartridge 2.

Calibration graph $y = 0.237\ x\ \ 0.0264$

Correlation coefficient $r = 0.9999$

Amount of Be in the sample   Let $y = 0$? $x = 0.111$ (ng) Be^{2+}

Trial #3

Amount of Be( ) spiked (ng)	Abs. (1+1)*	Abs. (×2)	Net Abs.
Blank	0.0094	0.0188	0
0	0.0240	0.0480	0.0292
0.100	0.0356	0.0712	0.0524
0.200	0.0481	0.0962	0.0774

*A mixture of 500 μL cartridge 1 and 500 μL cartridge 2.

Calibration graph $y = 0.241\ x\ \ 0.0289$

Correlation coefficient $r = 0.9998$

Amount of Be in the sample   Let $y = 0$? $x = 0.120$ (ng) Be^{2+}

Trial #1

Amount of Be( ) spiked (ng)	Abs. (1+1)*	Abs. (×2)	Net Abs.
Blank	0.0354	0.0707	0
0	0.1031	0.2061	0.1354
0.100	0.1144	0.2288	0.1581
0.200	0.1268	0.2536	0.1829

*A mixture of 500 µL cartridge 1 and 500 µL cartridge 2.

Calibration graph $y = 0.238 x   0.135$

Correlation coefficient $r = 0.9997$

Amount of Be in the sample   Let $y = 0$? $x = 0.567$ (ng) Be^{2+}

Trial #2

Amount of Be( ) spiked (ng)	Abs. (1+1)*	Abs. (×2)	Net Abs.
Blank	0.0303	0.0605	0
0	0.0949	0.1897	0.1292
0.100	0.1053	0.2106	0.1501
0.200	0.1181	0.2362	0.1757

*A mixture of 500 µL cartridge 1 and 500 µL cartridge 2.

Calibration graph $y = 0.233 x   0.128$

Correlation coefficient $r = 0.9983$

Amount of Be in the sample   Let $y = 0$? $x = 0.549$ (ng) Be^{2+}

Trial #3

Amount of Be( ) spiked (ng)	Abs. (1+1)*	Abs. (×2)	Net Abs.
Blank	0.0103	0.0205	0
0	0.0767	0.1534	0.1329
0.100	0.0887	0.1774	0.1569
0.200	0.1003	0.2005	0.1800

*A mixture of 500 μL cartridge 1 and 500 μL cartridge 2.

Calibration graph   y = 0.236 x   0.133

Correlation coefficient   r = 0.9999

Amount of Be in the sample   Let y = 0 ? x = 0.564 (ng) Be^{2+}

Trial #1

Amount of Be( ) spiked (ng)	Abs. (1+1)*	Abs. (×2)	Net Abs.
Blank	0.0068	0.0135	0
0	0.0152	0.0303	0.0168
0.100	0.0267	0.0533	0.0398
0.200	0.0393	0.0785	0.0650

*A mixture of 500 μL cartridge 1 and 500 μL cartridge 2.

Calibration graph   y = 0.241 x   0.0164

Correlation coefficient   r = 9997

Amount of Be in the sample   Let y = 0 ? x = 0.068 (ng) Be^{2+}

Trial #2

Amount of Be( ) spiked (ng)	Abs. (1+1)*	Abs. (×2)	Net Abs.
Blank	0.0068	0.0135	0
0	0.0157	0.0313	0.0178
0.100	0.0271	0.0542	0.0407
0.200	0.0396	0.0791	0.0656

*A mixture of 500 μL cartridge 1 and 500 μL cartridge 2.

Calibration graph $y = 0.239 x   0.0175$

Correlation coefficient $r = 0.9997$

Amount of Be in the sample   Let y = 0 ? x = 0.073 (ng) Be^{2+}

Trial #3

Amount of Be( ) spiked (ng)	Abs. (1+1)*	Abs. (×2)	Net Abs.
Blank	0.0086	0.0172	0
0	0.0173	0.0345	0.0173
0.100	0.0288	0.0576	0.0404
0.200	0.0412	0.0824	0.0652

*A mixture of 500 μL cartridge 1 and 500 μL cartridge 2.

Calibration graph $y = 0.240 x   0.0170$

Correlation coefficient $r = 0.9998$

Amount of Be in the sample   Let y = 0 ? x = 0.071 (ng) Be^{2+}

Trial #1

Amount of Be( ) spiked (ng)	Abs. (1+1)*	Abs. (×2)	Net Abs.
Blank	0.0066	0.0131	0
0	0.0171	0.0342	0.0211
0.100	0.0291	0.0581	0.0450
0.200	0.0404	0.0807	0.0676

*A mixture of 500 μL cartridge 1 and 500 μL cartridge 2.

Calibration graph $y = 0.233 x$ 0.0213

Correlation coefficient $r = 0.9999$

Amount of Be in the sample   Let $y = 0$? $x = 0.091$ (ng) Be^{2+}

Trial #2

Amount of Be( ) spiked (ng)	Abs. (1+1)*	Abs. (×2)	Net Abs.
Blank	0.0086	0.0172	0
0	0.0188	0.0375	0.0203
0.100	0.0312	0.0623	0.0451
0.200	0.0422	0.0843	0.0671

*A mixture of 500 μL cartridge 1 and 500 μL cartridge 2.

Calibration graph $y = 0.234 x$ 0.0208

Correlation coefficient $r = 0.9994$

Amount of Be in the sample   Let $y = 0$? $x = 0.089$ (ng) Be^{2+}

Trial #3

Amount of Be( ) spiked (ng)	Abs. (1+1)*	Abs. (×2)	Net Abs.
Blank	0.0192	0.0384	0
0	0.0299	0.0597	0.0213
0.100	0.0412	0.0824	0.0440
0.200	0.0532	0.1064	0.0680

*A mixture of 500 µL cartridge 1 and 500 µL cartridge 2.

Calibration graph   y = 0.234 x   0.0210

Correlation coefficient   r = 0.9999

Amount of Be in the sample   Let y = 0 ? x = 0.090 (ng) Be^{2+}

MDL

= 20.0 mg

cartridge #1 1.00 mL

20 µL GFAAS 12

0.0443	0.0451	0.0452	0.0443	0.0444	0.0443
0.0437	0.0441	0.0445	0.0442	0.00451	0.0445

n = 12

$\bar{x}$ = 0.0445

s = 0.00045

MDL = 3s/m = $3 \times 4.5 \times 10^{-4}$ / 0.236 = 0.006 (ng)

MDL = 0.006 (ng) / 0.020 (g) = 0.3 (ng/g)

m y 0.236 x 6.88×10^{-4}