

**Method Parameters**

diverse metalen in water voor RUG Scheikunde dhr. Kruizinga 5-12-2006

verdunningsreagens: 2,0 ml salpeterzuur Merck suprapur, 1,0 ml Triton X-100, 1,0 liter water

bereiding standaarden

100 uLL stock (1000mg/L) verdunnen tot 100,0 ml (1,0 mg/L)

50 uLL stock (1000mg/L) verdunnen tot 100,0 ml (0,5 mg/L)

gecalibreerd zijn: Ag, Al, B, Ba, Bi, Ca, Cd, Co, Cr, Cu, Fe, Ga, In, K, Li, Mg, Mn, Na, Ni, Pb, Sr, Rl, Zn en ook Zr, Ti.  
pipeteer 1,0 ml monster/standaard en verdun met 3 ml verdunningsreagens, meng en meet.

toelichting: Er is meestal gemeten bij twee golflentes.

uncal betekend niet gecaliereerd, eventueel aanwezige signalen worden wel gemeten maar niet gekwantificeerd.  
negatieve getallen betekend niet aantoonbaar.De verdunningen zijn ingevoerd en worden berekend, dat betekend dat negatieve getallen no negatiever worden  
x betekend hoge waarde, boven het meetbereik van de calibratiecurve.

o betekend hoge waarde, detektor is overrange.

De getoonde waarde bij de verdunningen is de berekende waarde. Theoretisch

zou bij elke verdunning dezelfde waarde moeten worden berekend. In geval van Al zou de waarde bij verdunning 1000x  
en 10000 hetzelfde moeten zijn. (is 7837.4 en 8317.5)

Bel mij in geval van vragen, Hans van der Velde, 050-3634145

Sample Label	Ag 328.068	Ag 338.289	Al 396.152	As 188.980	As 193.696
	mg/L	mg/L	mg/L	mg/L	mg/L
Blank	0.00	0.00	0.0	0.00	0.00
Standard 1	0.50	0.50	0.5	0.50	0.50
Standard 2	1.00	1.00	1.0	1.00	1.00
PAN	0.06	0.03	-ox	uncal	uncal
PAN 10x	0.05	-0.11uv	-x	uncal	uncal
PAN 100x	-0.07uv	-0.74uv	-x	uncal	uncal
9 (negen]	-0.00uv	-0.01uv	0.6	uncal	uncal
9 (negen] 10x	-0.01uv	-0.10uv	1.2	uncal	uncal
9 (negen] 100x	-0.06uv	-0.99uv	4.9	uncal	uncal
PAN 1000x	-1.90uv	-8.24uv	7837.4	uncal	uncal
PAN 10000x	-12.82uv	-49.34uv	8317.5	uncal	uncal

Sample Label	Au 242.794	Au 267.594	B 249.678	B 249.772	Ba 455.403
	mg/L	mg/L	mg/L	mg/L	mg/L
Blank	0.00	0.00	0.00	0.00	0.00
Standard 1	0.50	0.50	0.50	0.50	0.50
Standard 2	1.00	1.00	1.00	1.00	1.00
PAN	uncal	uncal	2.63	2.67	0.10
PAN 10x	uncal	uncal	7.27	7.28	0.10
PAN 100x	uncal	uncal	-31.51uv	-27.90uv	0.04
9 (negen]	uncal	uncal	-0.46uv	-0.45uv	0.11
9 (negen] 10x	uncal	uncal	-8.32uv	-7.93uv	0.11
9 (negen] 100x	uncal	uncal	-100.61uv	-96.41uv	0.03
PAN 1000x	uncal	uncal	-1161.10uv	-1121.94uv	-0.77uv
PAN 10000x	uncal	uncal	-8349.27uv	-7915.30uv	-8.10uv

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Sample Label	Ba 493.408	Be 234.861	Be 313.042	Bi 222.821	Bi 223.061
	mg/L	mg/L	mg/L	mg/L	mg/L
Blank	0.00	0.00	0.00	0.00	0.00
Standard 1	0.50	0.50	0.50	0.50	0.50
Standard 2	1.00	1.00	1.00	1.00	1.00
PAN	0.10	uncal	uncal	0.50	0.34
PAN 10x	0.02	uncal	uncal	0.47	0.33
PAN 100x	-0.80uv	uncal	uncal	-0.56uv	-0.25uv
9 (negen]	0.10	uncal	uncal	-0.01uv	0.01
9 (negen] 10x	0.03	uncal	uncal	-0.11uv	0.02uv
9 (negen] 100x	-0.80uv	uncal	uncal	0.84	0.62
PAN 1000x	-9.09uv	uncal	uncal	-10.20uv	-0.62uv
PAN 10000x	-90.41uv	uncal	uncal	57.05	-45.34uv

Sample Label	Ca 393.366	Ca 396.847	Cd 214.439	Cd 226.502	Ce 418.659
	mg/L	mg/L	mg/L	mg/L	mg/L
Blank	0.00	0.00	0.00	0.00	0.00
Standard 1	0.50	0.50	0.50	0.50	0.50
Standard 2	1.00	1.00	1.00	1.00	1.00
PAN	-x	-x	0.07	0.07	-x
PAN 10x	7.03	7.12	0.02	0.07	3.21
PAN 100x	13.19	14.23	-0.46uv	0.01uv	-3.22uv
9 (negen]	-x	-ox	-0.00uv	0.00	0.02uv
9 (negen] 10x	34.81	32.78	-0.05uv	-0.00uv	0.63
9 (negen] 100x	36.23	35.10	-0.53uv	-0.05uv	7.85
PAN 1000x	45.78	54.21	-4.42uv	-0.53uv	-27.45uv
PAN 10000x	-11.92uv	87.32	-54.51uv	-6.58uv	13.65uv

Sample Label	Ce 446.021	Co 230.786	Co 238.892	Cr 205.560	Cr 267.716
	mg/L	mg/L	mg/L	mg/L	mg/L
Blank	0.00	0.00	0.00	0.00	0.00
Standard 1	0.50	0.50	0.50	0.50	0.50
Standard 2	1.00	1.00	1.00	1.00	1.00
PAN	uncal	0.08	-0.61uv	1.70	1.65
PAN 10x	uncal	0.07	-0.63uv	1.62	1.66
PAN 100x	uncal	0.06uv	-0.66uv	1.27	1.61
9 (negen]	uncal	0.00	-0.00uv	-0.00uv	0.00
9 (negen] 10x	uncal	-0.00uv	0.00uv	-0.01uv	0.00uv
9 (negen] 100x	uncal	0.01uv	-0.03uv	-0.23uv	-0.01uv
PAN 1000x	uncal	-0.03uv	-1.06uv	-1.08uv	1.91
PAN 10000x	uncal	-16.16uv	-5.40uv	-18.58uv	6.42uv

Sample Label	Cs 459.311	Cs 697.327	Cu 324.754	Cu 327.395	Fe 238.204
	mg/L	mg/L	mg/L	mg/L	mg/L
Blank	0.00	0.00	0.00	0.00	0.00
Standard 1	0.50	0.50	0.50	0.50	0.50
Standard 2	1.00	1.00	1.00	1.00	1.00
PAN	uncal	uncal	-x	-x	-x
PAN 10x	uncal	uncal	87.82	87.59	86.33
PAN 100x	uncal	uncal	84.90	84.82	85.62
9 (negen]	uncal	uncal	0.05	0.06	0.10
9 (negen] 10x	uncal	uncal	-0.01uv	0.04	0.11
9 (negen] 100x	uncal	uncal	-0.81uv	-0.03uv	0.19
PAN 1000x	uncal	uncal	91.80	84.30	88.75
PAN 10000x	uncal	uncal	36.46	57.37	92.67

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Sample Label	Fe 259.940	Hg 184.887	Hg 194.164	I 178.215	I 182.976
	mg/L	mg/L	mg/L	mg/L	mg/L
Blank	0.00	0.00	0.00	0.00	0.00
Standard 1	0.50	0.50	0.50	0.50	0.50
Standard 2	1.00	1.00	1.00	1.00	1.00
PAN	-x	uncal	uncal	uncal	uncal
PAN 10x	85.51	uncal	uncal	uncal	uncal
PAN 100x	85.42	uncal	uncal	uncal	uncal
9 (negen]	0.10	uncal	uncal	uncal	uncal
9 (negen] 10x	0.10	uncal	uncal	uncal	uncal
9 (negen] 100x	0.01uv	uncal	uncal	uncal	uncal
PAN 1000x	86.50	uncal	uncal	uncal	uncal
PAN 10000x	86.21	uncal	uncal	uncal	uncal

Sample Label	K 766.491	K 769.897	La 333.749	La 379.477	Li 610.365
	mg/L	mg/L	mg/L	mg/L	mg/L
Blank	0.00	0.00	0.00	0.00	0.00
Standard 1	0.50	0.50	0.50	0.50	0.50
Standard 2	1.00	1.00	1.00	1.00	1.00
PAN	2.08	2.35	uncal	uncal	0.02
PAN 10x	2.53	3.20	uncal	uncal	0.26
PAN 100x	10.19	9.31	uncal	uncal	1.82
9 (negen]	3.16	3.26	uncal	uncal	0.02
9 (negen] 10x	2.86	2.61	uncal	uncal	0.18
9 (negen] 100x	2.88	1.30	uncal	uncal	1.79
PAN 1000x	345.57	322.41	uncal	uncal	17.89
PAN 10000x	215.00	116.30	uncal	uncal	185.65

Sample Label	Li 670.783	Mg 279.553	Mg 280.270	Mn 257.610	Mn 259.372
	mg/L	mg/L	mg/L	mg/L	mg/L
Blank	0.00	0.00	0.00	0.00	0.00
Standard 1	0.50	0.50	0.50	0.50	0.50
Standard 2	1.00	1.00	1.00	1.00	1.00
PAN	0.01	-x	-x	9.65	9.88
PAN 10x	0.06	33.96	35.54	9.76	9.87
PAN 100x	0.32	34.73	35.91	9.60	9.68
9 (negen]	0.01	2.50	2.63	0.04	0.04
9 (negen] 10x	0.03	2.65	2.73	0.01	0.01
9 (negen] 100x	0.27	2.85	2.62	-0.23uv	-0.23uv
PAN 1000x	6.34	44.91	43.07	7.60	7.56
PAN 10000x	47.94	77.60	47.98	-17.39uv	-19.09uv

Sample Label	Mo 202.032	Mo 204.598	Na 588.995	Na 589.592	Ni 216.555
	mg/L	mg/L	mg/L	mg/L	mg/L
Blank	0.00	0.00	0.00	0.00	0.00
Standard 1	0.50	0.50	0.50	0.50	0.50
Standard 2	1.00	1.00	1.00	1.00	1.00
PAN	uncal	uncal	1.71	1.70	3.02
PAN 10x	uncal	uncal	2.21	2.32	3.03
PAN 100x	uncal	uncal	6.53	6.84	2.57
9 (negen]	uncal	uncal	3.93	4.48	0.01
9 (negen] 10x	uncal	uncal	4.18	4.11	-0.02uv
9 (negen] 100x	uncal	uncal	5.61	5.99	-0.51uv
PAN 1000x	uncal	uncal	32.23	34.72	-0.55uv
PAN 10000x	uncal	uncal	81.91	110.47	-33.38uv

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Sample Label	Ni 231.604	Os 225.585	Os 228.228	Pb 182.143	Pb 220.353
	mg/L	mg/L	mg/L	mg/L	mg/L
Blank	0.00	0.00	0.00	0.00	0.00
Standard 1	0.50	0.50	0.50	0.50	0.50
Standard 2	1.00	1.00	1.00	1.00	1.00
PAN	3.03	uncal	uncal	3.27	2.97
PAN 10x	3.07	uncal	uncal	3.41	3.09
PAN 100x	2.76	uncal	uncal	3.71	2.61
9 (negen]	0.01	uncal	uncal	0.22	0.22
9 (negen] 10x	-0.01uv	uncal	uncal	0.22	0.18
9 (negen] 100x	-0.23uv	uncal	uncal	-1.40uv	-0.08uv
PAN 1000x	1.91uv	uncal	uncal	-16.00uv	-5.48uv
PAN 10000x	1.90	uncal	uncal	-28.06uv	-24.93uv

Sample Label	Sc 335.372	Sc 361.383	Sc 361.383	Se 196.026	Se 203.985
	mg/L	mg/L	mg/L	mg/L	mg/L
Blank	0.00	0.00	0.00	0.00	0.00
Standard 1	0.50	0.50	0.50	0.50	0.50
Standard 2	1.00	1.00	1.00	1.00	1.00
PAN	uncal	uncal	uncal	uncal	uncal
PAN 10x	uncal	uncal	uncal	uncal	uncal
PAN 100x	uncal	uncal	uncal	uncal	uncal
9 (negen]	uncal	uncal	uncal	uncal	uncal
9 (negen] 10x	uncal	uncal	uncal	uncal	uncal
9 (negen] 100x	uncal	uncal	uncal	uncal	uncal
PAN 1000x	uncal	uncal	uncal	uncal	uncal
PAN 10000x	uncal	uncal	uncal	uncal	uncal

Sample Label	Si 251.611	Si 288.158	Sn 189.927	Sn 283.998	Te 182.150
	mg/L	mg/L	mg/L	mg/L	mg/L
Blank	0.00	0.00	0.00	0.00	0.00
Standard 1	0.50	0.50	0.50	0.50	0.50
Standard 2	1.00	1.00	1.00	1.00	1.00
PAN	3.62	3.67	uncal	-x	uncal
PAN 10x	3.41	3.42	uncal	1.59	uncal
PAN 100x	3.51	0.72	uncal	0.74	uncal
9 (negen]	2.19	2.23	uncal	-0.01uv	uncal
9 (negen] 10x	2.13	1.94	uncal	-0.06uv	uncal
9 (negen] 100x	1.12	-1.57uv	uncal	-0.93uv	uncal
PAN 1000x	-3.01uv	16.17	uncal	-14.12uv	uncal
PAN 10000x	-94.04uv	-184.55uv	uncal	-179.15uv	uncal

Sample Label	Te 214.282	Ti 334.941	Ti 336.122	Tl 190.794	Tl 276.789
	mg/L	mg/L	mg/L	mg/L	mg/L
Blank	0.00	0.00	0.00	0.00	0.00
Standard 1	0.50	0.50	0.50	0.50	0.50
Standard 2	1.00	1.00	1.00	1.00	1.00
PAN	uncal	2.65	2.57	0.03	0.01uv
PAN 10x	uncal	2.62	2.59	0.02uv	-0.16uv
PAN 100x	uncal	2.31	2.21	0.22uv	-2.39uv
9 (negen]	uncal	-0.00uv	-0.00uv	0.00uv	-0.00uv
9 (negen] 10x	uncal	-0.03uv	-0.02uv	0.04	0.20uv
9 (negen] 100x	uncal	-0.24uv	-0.25uv	-0.42uv	2.29
PAN 1000x	uncal	0.28uv	-0.04uv	-5.50uv	40.90uv
PAN 10000x	uncal	-20.68uv	-21.43uv	-2.92uv	425.12uv

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Sample Label	U 367.007	U 385.957	U 409.013	V 292.401	V 309.310
	mg/L	mg/L	mg/L	mg/L	mg/L
Blank	0.00	0.00	0.00	0.00	0.00
Standard 1	0.50	0.50	0.50	0.50	0.50
Standard 2	1.00	1.00	1.00	1.00	1.00
PAN	uncal	uncal	uncal	uncal	uncal
PAN 10x	uncal	uncal	uncal	uncal	uncal
PAN 100x	uncal	uncal	uncal	uncal	uncal
9 (negen]	uncal	uncal	uncal	uncal	uncal
9 (negen] 10x	uncal	uncal	uncal	uncal	uncal
9 (negen] 100x	uncal	uncal	uncal	uncal	uncal
PAN 1000x	uncal	uncal	uncal	uncal	uncal
PAN 10000x	uncal	uncal	uncal	uncal	uncal

Sample Label	Zn 202.548	Zn 213.857	Zr 339.198	Zr 343.823
	mg/L	mg/L	mg/L	mg/L
Blank	0.00	0.00	0.00	0.00
Standard 1	0.50	0.50	0.50	0.50
Standard 2	1.00	1.00	1.00	1.00
PAN	-x	-x	0.08	0.09
PAN 10x	-x	-x	0.05	0.05
PAN 100x	240.05	236.40	-0.15uv	-0.20uv
9 (negen]	0.41	0.40	-0.00uv	-0.00uv
9 (negen] 10x	0.38	0.36	-0.02uv	-0.03uv
9 (negen] 100x	0.13	-0.13uv	-0.17uv	-0.27uv
PAN 1000x	236.36	242.77	-2.10uv	-2.67uv
PAN 10000x	164.77	151.88	-18.98uv	-27.45uv