

COURTAGE ANALYSES SERVICES

AAS, ICP
CHN, Hg

ICP/ICP-MS

AAS

Standards

Digestion

Mercury

CHNOS

Platinum labware

Ecotoxicology



GLASS EXPANSION

Spectron

PHOTRON



analytika

SAVILLEX

**ENVIRONMENTAL
EXPRESS**



BERGHOF

ALTEC

SANTIS

**BIRMINGHAM METAL
COMPANY LIMITED**

LemnaTec



Accessoires universels pour améliorer la productivité en ICP

Laurent Bertal, Glass Expansion,

Niagara™ Accessoire de Rinçage Rapide

- Interface entre ICP & le passeur automatique
- Réduit le temps de rinçage
- Programmable en temps
- Moins de 25cm de haut

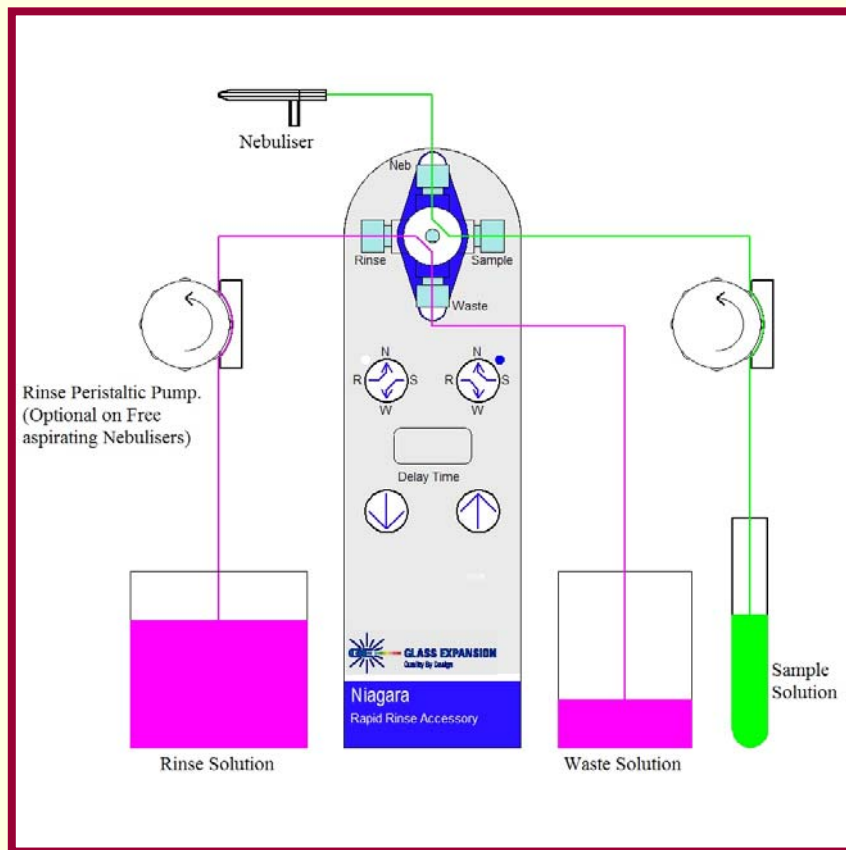


Avantage de la réduction du temps du Cycle Analytique

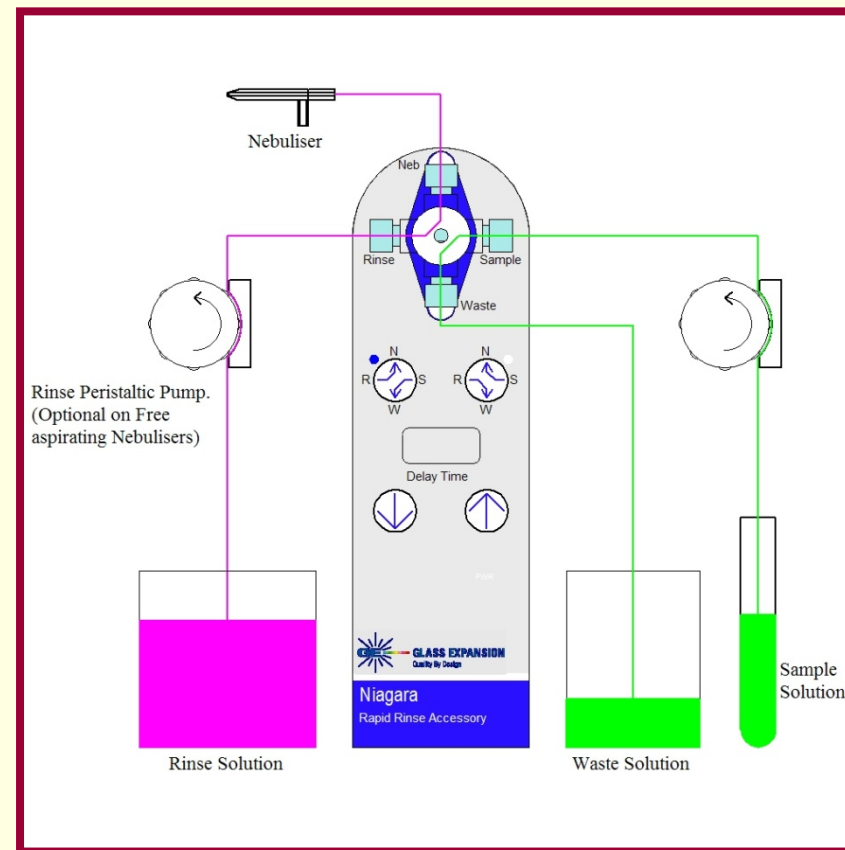
- Plus d'échantillons/heure
- Réduction du délais de réponse
- Retarder l'investissement dans un appareil supplémentaire
- Réduction du coût en consommables /échantillon
 - Argon
 - Torches
 - Nébuliseurs
 - Cônes



Comment fonctionne le Niagara



Analyses



Rinçage

Temps gagné avec le Niagara

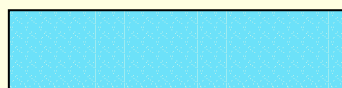
Elan 6000 ICP-MS, Hill Labs, New Zealand

Courtage Analyses Services 14 rue des Mouettes 76130 Mont
Saint Aignan cas@onlinecas.com

30 s de rinçage

10 s de rinçage

	SystemeStandard	Avec Niagara
Aiguille à l'échantillon	4	4
Temps d'aspiration	20	20
Stabilisation	8	8
Lecture	40	40
Aiguille à rinçage	4	4
Rinçage (purge)	16	10
Rinçage (fin)	14	0
Total (seconds)	106	86
Total Rinse (seconds)	38	38



=Etape de Rinçage du nebuliseur et de la chambre

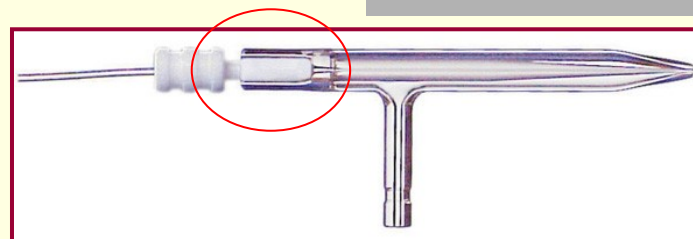
Glass Expansion

www.geicp.com

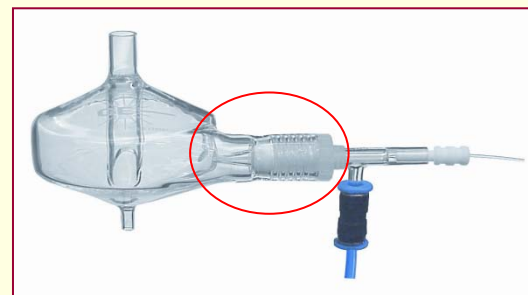


Supprimer les volumes morts

- Nébuliseur – EzyFit



- Chambre de nébulisation



- Standard Interne – Chambre de faible volume



Chambre de nébulisation thermostatée, universelle, programmée pour ICP-OES et ICP-MS

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Les limitations des chambres de nébulisation à Température ambiante

- Dérive de la sensibilité avec la température
- Chargement du plasma excessif(solvants volatils)
- Formation d'oxyde important
- Contrôle insuffisant des analytes transportés



IsoMist™ Chambre cyclonique thermostatée



Glass Expansion

www.geicp.com



IsoMist Encapsulated Spray Chamber



IsoMist sur Optima 2100DV

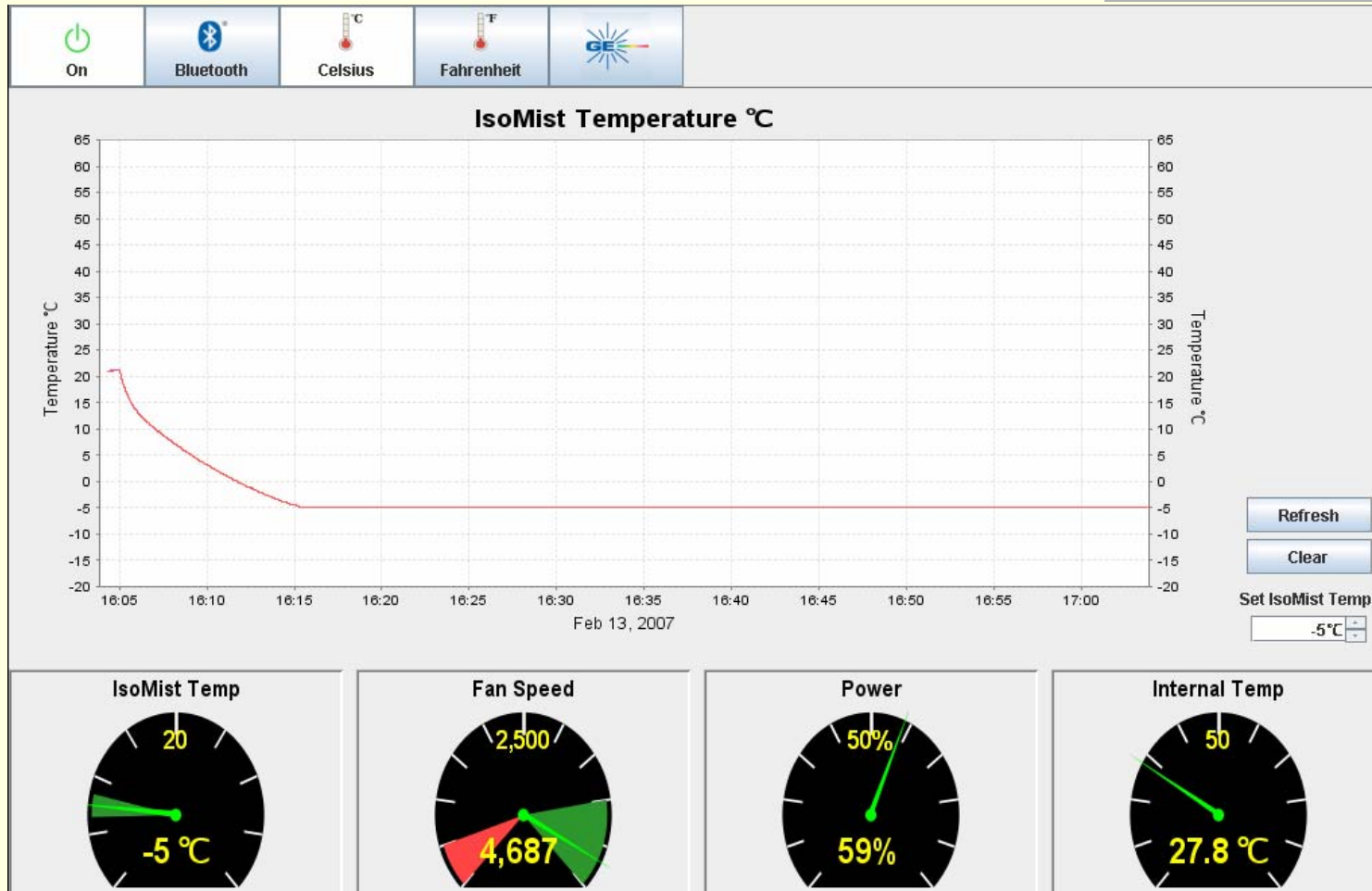


Glass Expansion

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PC Screen showing IsoMist Software



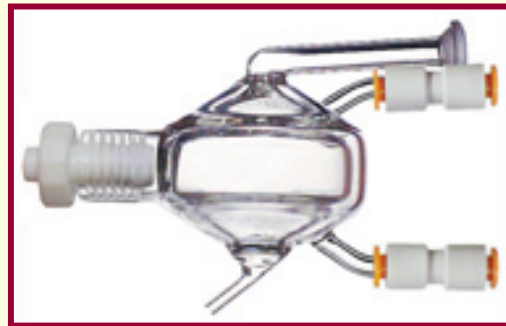
Features of IsoMist

- Powerful Peltier-effect chiller reaches -5C in 15 minutes (chamber interior)
- Programmable from -10 to 60C in 1 degree increments
- Maintains temperature to within 0.5 degree
- Compact design (7.5x4x4 inches)
- 100% self-contained (no external lines)
- Incorporates Bluetooth® technology for clean wireless control (USB available)
- Compatible with all ICP-OES and ICP-MS models



Limitations of Externally Controlled Spray Chambers

- Requires antifreeze solution
- Requires bulky floor model chiller
- Cumbersome coolant lines from chiller to chamber
- Freezing of condensate on lines
- Requires intricate jacketed chamber



Determination of Trace Metals in Naphtha

- Interfere with the cracking process
- Poisoning of the catalysts
- Environmental release concerns
- Origin and migration markers

Too volatile for room temperature analysis due to excessive plasma loading



Analysis of Naphtha by ICP-OES

PE Optima 2100 DV (Axial view)

- Forward Power: 1500Watts
- Coolant flow: 20L/min
- Auxiliary flow: 1.8L/min
- Nebulizer gas flow: 0.35L/min
- Injector: 1mm capillary bore
- Spray Chamber: Twister baffled cyclonic
- Nebulizer: SeaSpray glass concentric
- Uptake rate: 300ul/min



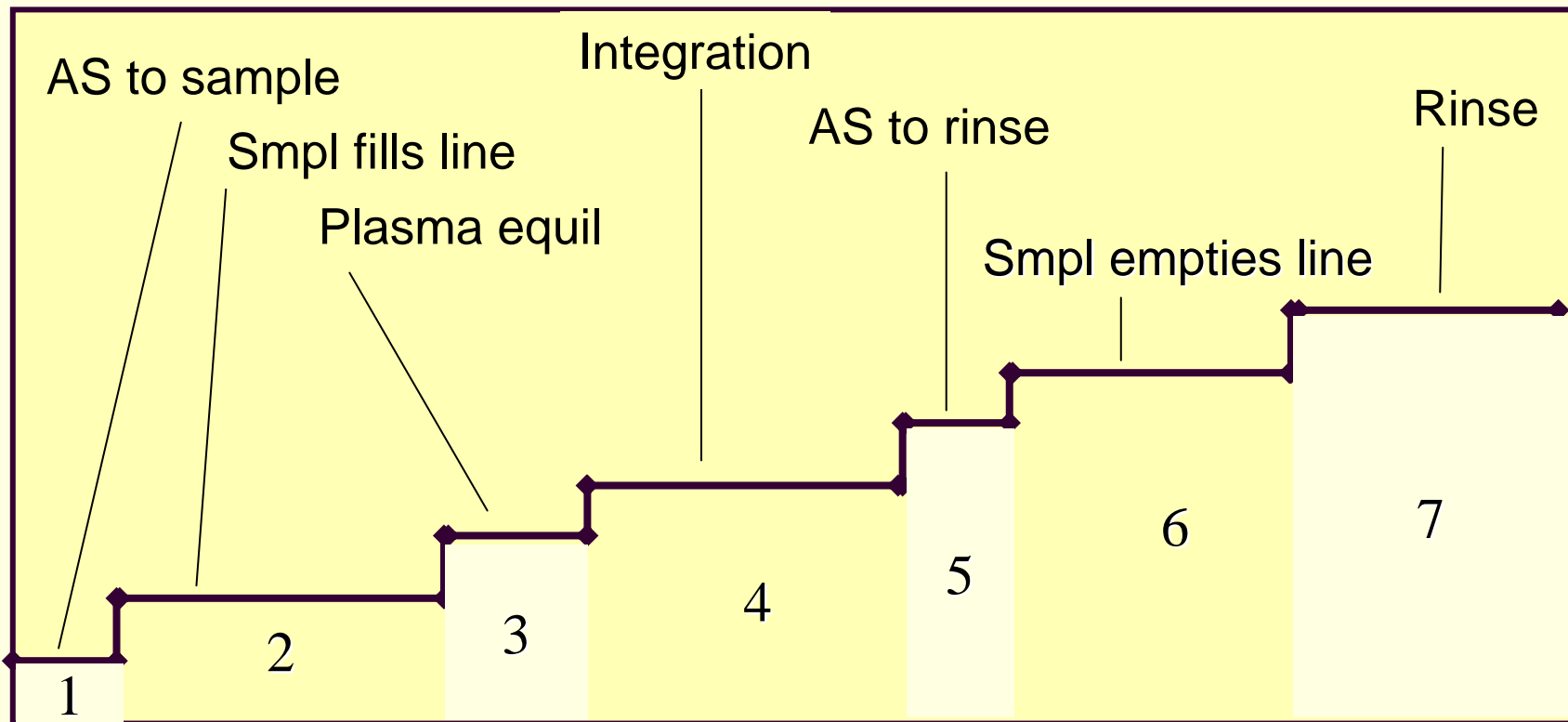
Methodes pour Reduire le cycle d'analyse

(sans degradation des performances)

- Réduire les volumes morts
- Améliorer les logiciels
- La commutation des vannes



Sample Cycle for Unattended ICP Analysis

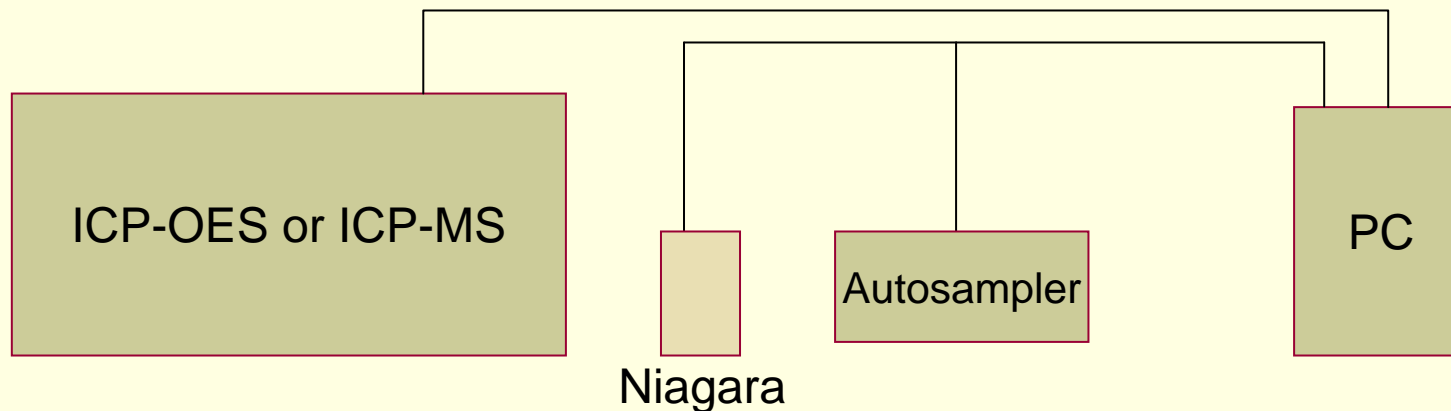


Approche logiciel pour accélérer les analyses

- Pompe rapide en mode rinçage
 - Temps d'équilibre plus long
- Rinçage anticipé
 - Complique le contrôle qualité
 - Risque de contamination croisée
- Rinçage intelligent
 - Rinçage basé sur le résultat de l'échantillon
 - Analyse du rinçage déterminant le temps optimum
 - Gain Modeste de productivité

Niagara Interface — no software required

- Started with hardware trigger on AS
- Recently modified to serial interface
- Serial cable runs from ICP computer through the AS to the Niagara.
- Each Niagara is preprogrammed for a specific ICP/AS combination.



ICP-MS Carryover Comparison

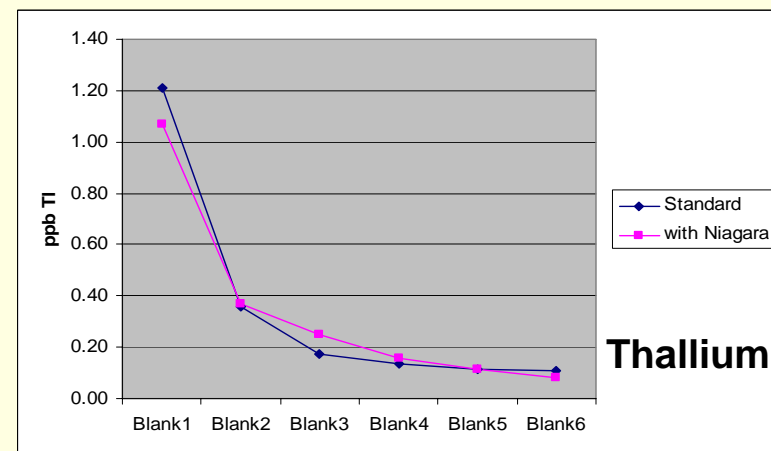
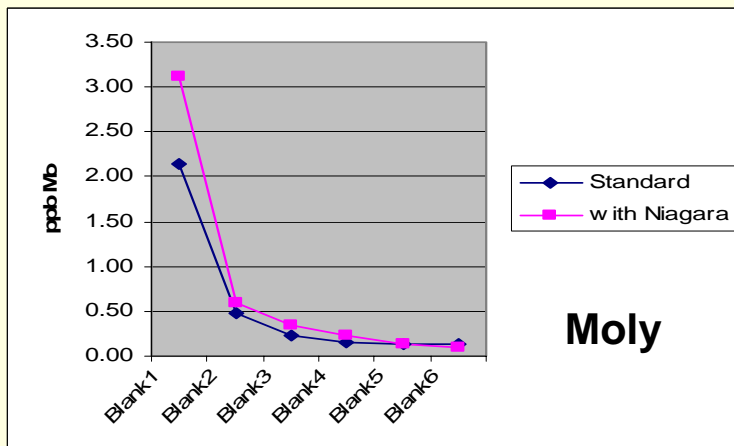
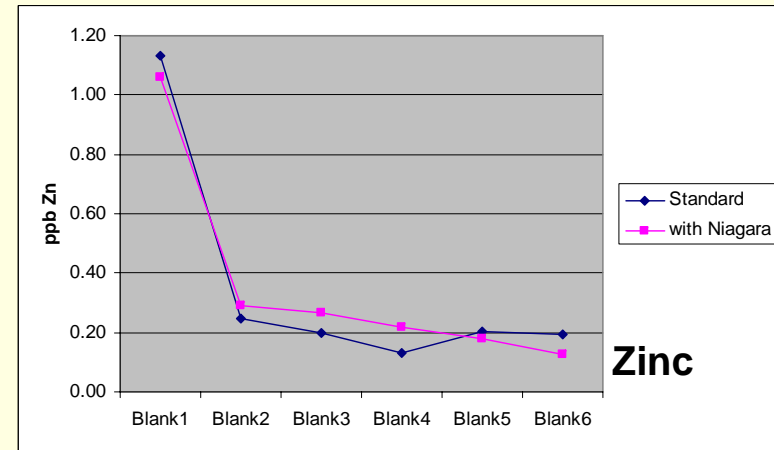
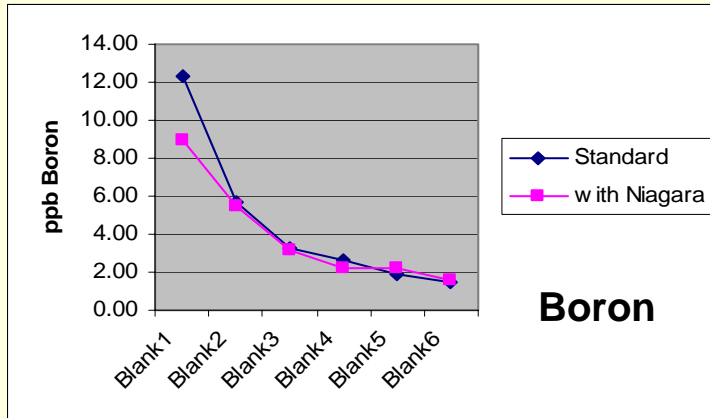
	B	Fe	Zn	Se	Mo	Cd	Sn	Sb	Tl	Bi
5ppm Solution	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00
Blank1	12.30	4.29	1.13	1.00	2.13	0.89	3.96	5.32	1.21	1.27
Blank2	5.64	3.46	0.25	0.54	0.48	0.21	1.22	1.38	0.36	0.36
Blank3	3.22	4.54	0.20	0.34	0.22	0.10	0.76	0.79	0.18	0.20
Blank4	2.68	-1.70	0.13	0.20	0.15	0.08	0.59	0.62	0.14	0.12
Blank5	1.90	2.16	0.21	0.00	0.14	0.07	0.41	0.44	0.11	0.13
Blank6	1.49	0.44	0.19	0.07	0.13	0.09	0.36	0.36	0.11	0.15

Standard method without Niagara

With Niagara

	B	Fe	Zn	Se	Mo	Cd	Sn	Sb	Tl	Bi
5ppm Solution	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00	5000.00
Blank1	8.97	1.88	1.06	0.71	3.13	0.80	5.14	9.32	1.07	1.06
Blank2	5.43	7.59	0.29	0.53	0.59	0.24	1.59	2.05	0.37	0.37
Blank3	3.16	6.95	0.27	0.31	0.35	0.18	0.97	1.23	0.25	0.27
Blank4	2.21	1.26	0.22	0.12	0.22	0.13	0.71	0.91	0.16	0.17
Blank5	2.26	7.33	0.18	-0.09	0.13	0.07	0.49	0.54	0.11	0.13
Blank6	1.55	4.48	0.12	0.07	0.09	0.05	0.38	0.44	0.08	0.09

ICP-MS Carryover Comparison



On-Line Productivity Calculator

www.geicp.com

Autosampler Movement Delay sec
Integration Time/Replicate Read Time sec
Number of Integrations/Replicates
Sample Uptake Delay sec
Instrument Stabilization Delay sec
Rinse Time sec
Unaccounted Time (Processing etc) sec

Update calculation >>	standard instrument	with Niagara
Total analysis time per sample (sec)	105	80
Samples processed per hour	34	45*

*** Improvement with Niagara: 32%**



Payback with Niagara-Commercial Lab

	Without Niagara	With Niagara
Samples/hour	34	45
Samples/ 8 hour day	272	360
Extra samples per day	0	88
Extra samples less QC's	0	79
Price per sample	\$50	\$50
Extra revenue per day	\$0	\$3950
Extra revenue per month	\$0	\$79,000
Extra revenue per year	\$0	\$948,000



Summary

- Decrease dead-volume in sample introduction system to reduce rinse time
- Software approaches produce marginal productivity improvements
- Niagara produces clear gains in productivity without jeopardizing performance.

