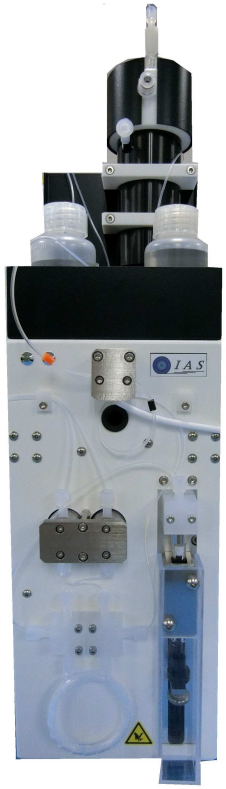
MSAG
Metal Standard Aerosol Generation

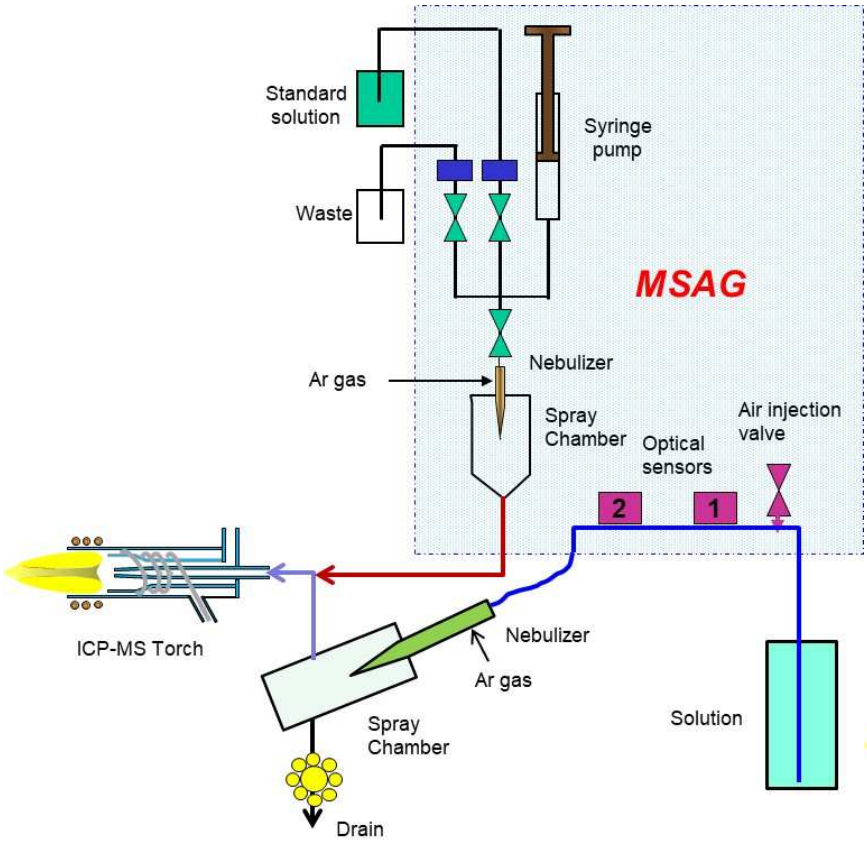
IAS Inc.

MSAG is an indispensable tool for nano-particle analysis and direct gas analysis such as laser ablation (LA) and Gas Exchange Device (GED) by ICP-MS.

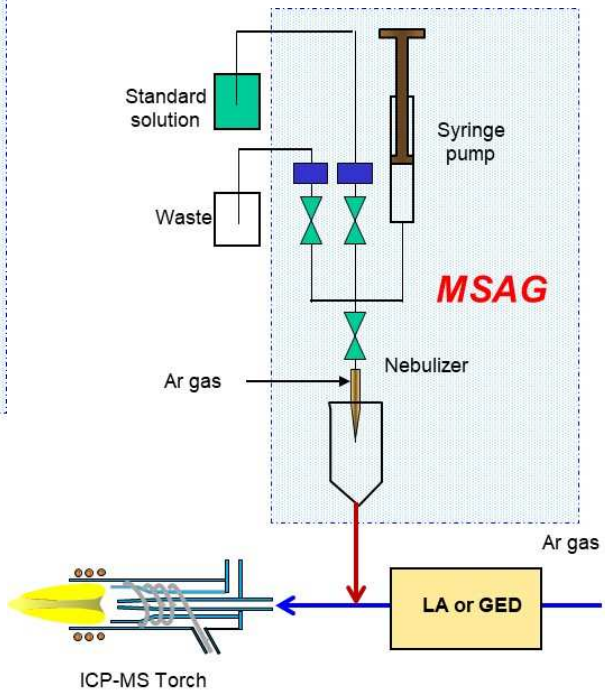
Features



- High precision syringe pump can introduce metal standard solution at a 1 µL/min to a nebulizer and a 100% of solution is introduced to the plasma of ICP-MS. As a result, the absolute amount of each element, e.g. ag/sec and atoms/sec, introduced to the plasma can be calculated. As a result, analysis of standard nano-particle such as Au is not required.
- ICP-MS signal detected, e.g. counts/sec, from the standard solution above gives the sensitivity of each element in ag/count.
- Transient signal analysis of ICP-MS can detects particles, which gives absolute amount of each element in ag, which can calculate diameter of one particle.
- Concentration of metallic impurities in gases in ng/kg or ng/m^3 can be calculated as well as the particle size distribution of each element.
- Metal free structure for all contact parts with standard solution.



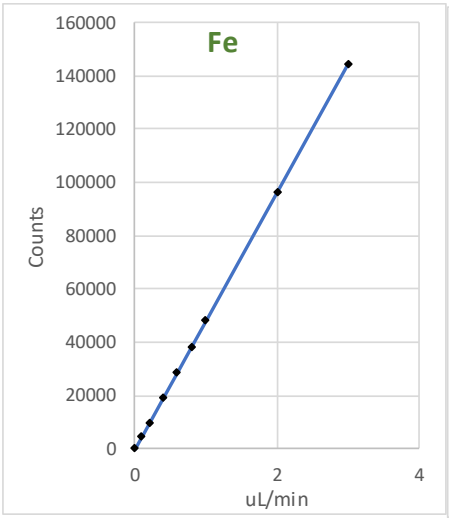
MSAG for nano particle analysis in solution.

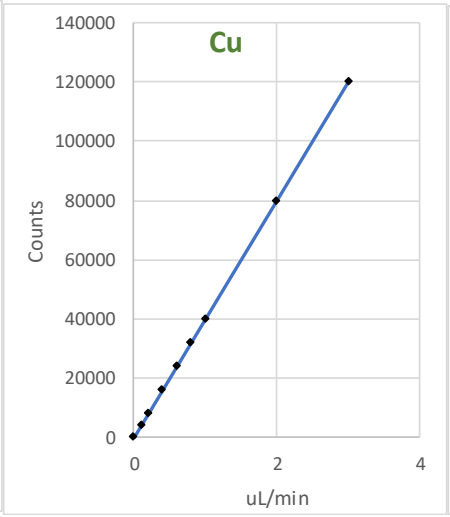


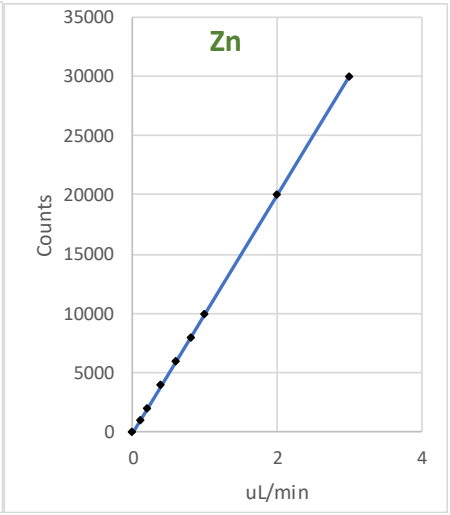
Nano particle analysis in gas.

Calibration Curve by MSAG

- A 10 ng/mL mixed metal standard solution was directly introduced to a nebulizer from 0 to 3 µL/min by means of MSAG.
- MSGG (Metal Standard Gas Generation) unit was also used to monitor variation of ICP-MS sensitivity, and Mo gaseous standard was used as an internal standard.
- Linear calibration curves with internal standard correction were obtained below 3 µL/min.
- Three different nebulizer was checked with a 1 µL/min flow rate, and reproducible results were obtained, which indicated that a 100% of standard solution introduced to the nebulizer was introduced to the plasma of ICP-MS.
- When the standard solution was introduced over 3 µL/min, the sensitivity started decreasing, which indicated that some portion of standard solution was trapped in a spray chamber.

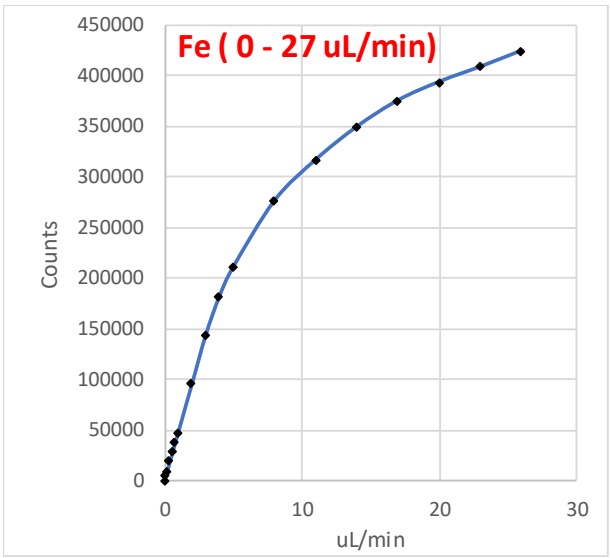


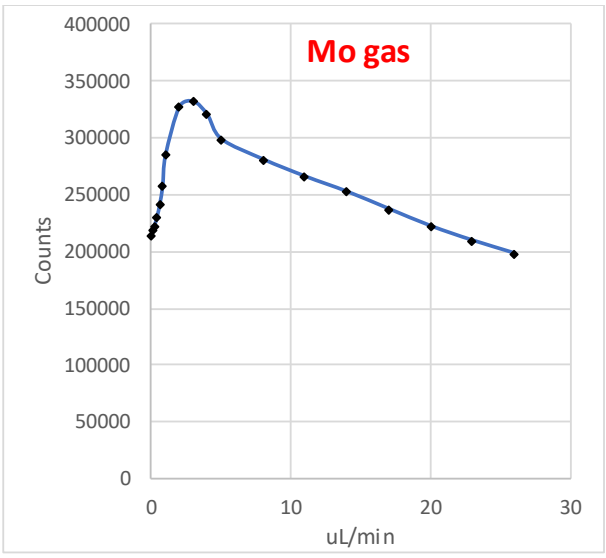




	MSAG			MSGG		
	51V	208Pb	238U	52Cr	95Mo	182W
Nebulizer 1	35,278	378,438	798,065	111,615	45,460	88,481
Nebulizer 2	36,077	391,145	829,978	111,389	44,435	88,354
Nebulizer 3	35,732	393,829	833,304	110,553	44,054	86,670
SD	401	8,221	19,456	559	727	1,011
Average	35,695	387,804	820,449	111,186	44,650	87,835
RSD (%)	1.12	2.12	2.37	0.50	1.63	1.15

(Unit : count)

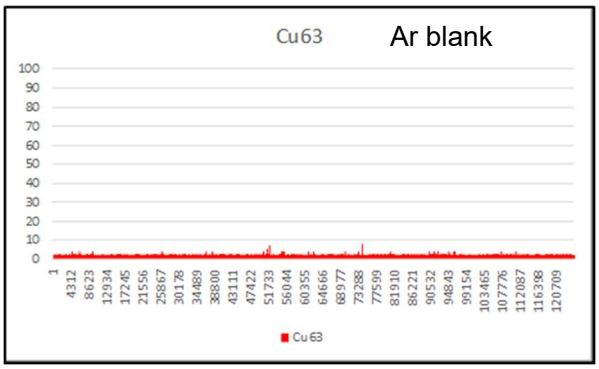


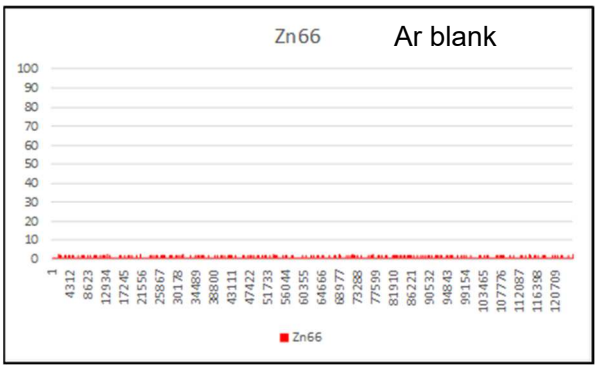


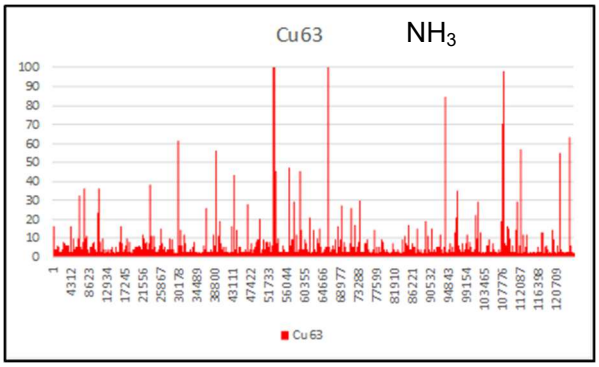
Counts in Y axis is compensated intensity with Mo internal standard based on the count obtained at 1 uL/min uptake rate .

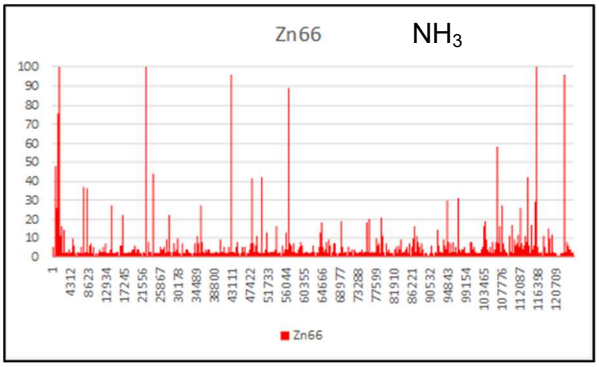
Metal particle analysis in NH_3 gas by GED

- Many particles of Cu and Zn were detected in a high purity NH_3 gas by GED-ICP-MS.
- The concentration of Cu and Zn was calculated aqueous standard solution 0.48 and 0.07 ng/kg, respectively.
- One particle with 5 counts signal was equivalent to 30 and 36 nm particle size of pure Cu and Zn, respectively.









Specifications

Model : MSAG
Flow range : 0.10～3.00 µL/min
Syringe : Glass 500 µL
Nebulizer : High efficiency concentric
Spray chamber : Glass

Environment & Utilities
Room temperature : 15～30℃
Humidity : 35～85%RH no condensation
Power : 100～240 VAC ±10% 2 A, Single phase, 50/60 Hz
Size : 166(W) x 295(D) x 630(H) mm
Weight : 9 kg

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