

Preparation of Food Samples Using Homogenization and Microwave-Assisted Wet Acid Digestion for Multi-Element Determination with ICP-MS

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Materials

Name	Company	Catalog Number	Comments
Ar gas	Messer	7440-37-1	Ar 5.0 gas (purity 99.999%).
AS-10 Autosampler system	Shimadzu		Autosampler connected to the ICP-MS, containing 68 ports for samples.
Automatic pipettes	Sartorius		200 μ L, 1 mL, and 5 mL automatic pipettes.
Balance XSE104	Mettler Toledo, Columbus, Ohio, USA		Analytical balance scale with a maximum weighing mass of 120 g.
Ceramic knife			Ceramic knife used for cutting fresh food samples.
Dessicator			Glass desiccator with lumps of silica gel.
ETHOS LEAN	Milestone, Sorisole, Italy		Microwave system for wet acid digestion in closed 100 mL vessels made of TFM-PTFE.
Fume hood			Laboratory fume hood with adjustable air flow.
Glass beakers RASOTHERM	CarlRoth GmbH + Co.KG		50 mL, 250 mL glass beakers
Glass funnels			Small glass funnels fitting into the neck of volumetric flasks.
He gas	Messer	7440-59-7	He 5.0 gas (purity 99.999%).
Hydrogen peroxide	ThermoFisher Scientific	7722-84-1	Hydrogen peroxide 100 volumes 30 wt.% solution. Laboratory reagent grade.
ICP multi-element standard solution VIII	Supelco	109492	100 mg/L ICP multi-element standard solution containing 24 elements (Al, B, Ba, Be, Bi, Ca, Cd, Co, Cr, Cu, Fe, Ga, K, Li, Mg, Mn, Na, Ni, Pb, Se, Sr, Te, Ti, Zn) in 2 % dilute nitric acid.
ICPMS 2030	Shimadzu		Inductively coupled plasma mass spectrometry system for multi-element analysis of digested samples.

ICP-MS Tuning Solution A	CarlRoth GmbH + Co.KG		250 mL tuning solution containing 6 elements (Be, Bi, Ce, Co, In, Mn) in 1 % nitric acid.
KIMTECH Purple Nitrile gloves	Kimberly-Clark GmbH		Disposable Purple Nitrile gloves (S, M or L).
Laboratory coat	Any available supplier		/
Mixer B-400	BÜCHI Labortechnik AG, Flawil, Switzerland		Laboratory mixer with ceramic blades.
Nitric acid	ThermoFisher Scientific	7697-37-2	Nitric acid, trace analysis grade, 68 wt%, density 1.42, Primar Plus, For Trace Metal Analysis.
Plastic centrifuge tubes	Isolab		50 mL plastic centrifuge tubes with screw caps, single use.
Plastic syringes Injekt	B. Braun		2 pice, single use 20 mL syringes.
Plastic tubes for autosampler	Shimadzu	046-00147-04	Plastic tubes for autosampler, 15 mL capacity, 16 mm diameter, 100 mm length.
Plastic waste containers			Plastic containers for the removal of chemicals after the cleaning procedure of reaction vessels.
Protective googles			/
Samples (broccoli, sausage, noodles, zucchini, mushrooms)			Fresh samples, which were dried to a constant weight and homogenized during the procedure. The samples were purchased from a local shop.
Spatula			Plastic spatula.
Sterilizer Instrumentaria ST 01/02	Instrumentaria		Dryer with adjustable temperature.
Syringe filters	CHROMAFIL Xtra	729212	Syringe filters with polypropylene housing and polyamide hydrophilic membrane. Membrane diameter 25 mm, membrane pore size 0.2 µm.
Ultrapure water	ELGA Labwater, Veolia Water Technologies.		Ultrapure water with a resistivity of 18.2 MΩcm, obtained with laboratory water purification system.
Volumetric flasks			25 mL glass volumetric flasks.