Notes on the Forms for the Total Microwave Digestion in the Working Group Soil Science

The microwaves of the working groups soil science and agronomy (MarsXpress) have an inner and an outer ring. In general, both rings can be occupied by 40 places. However, since this entails an enormous space requirement under the fume hood and an increase in time required, you usually only work with the outer ring (24 places). There are separate forms for the inner (microwave no. 1 to 16) and the outer ring (microwave no. 17 to 40) for the common digestion methods. The forms are available electronically and hence can be filled in electronically (except for weigh-in and date sections) and printed.

The client fills in the blanks *Project/experiment* and *Client*, ticks the elements to be determined and clarifies whether the extracting agent volume, weigh-in and final volume remain by default respectively which final volume is selected (expected element concentration). The person who carries out the weighing-in (client or lab assistant) fills in the other blanks. The blank *Date of ICP measurement* is filled in by the lab assistant on the day of measurement. The date (e.g. 1 month after ICP measurement) or a comment (e.g. ask client) can be filled in in the blank *Date of extraction*.
The given blank values are the minimum blank values. If required, more can be inserted. Care has to be taken that two blank values or empty vessels are not behind one another. Short and logical ICP numbers should be chosen to facilitate the sample input at the ICP-OES, e.g. consecutive numbers ascending from at 1. The column *Comment* can be used to fill in irregularities with single samples (if needed). If several microwave digestions are necessary for a sample series, this can be entered as page x of y at the end of the page. Otherwise, page 1/1 is entered. The form is copied after the measurement at the ICP-OES. The client keeps one sheet, the other remains with the samples until the disposal.

Aqua regia digestion for soil and sediment												
Order no.:		Project/experiment:						Client:				
Date of weigh-in:		Date of extraction:						Date of ICP measurement:				
Extracting agent in ml: HCl 6 HNO_3 2		Weigh-in: ≤ 0.5 g Volume: 100 ml						Date of disposal:				
Elements to be determined:		Al	Ca	Cd	Cu	Fe	K	Mg	Mn	Ni	P	Zn
tick												
Lab no.	Parallel	Microw. no.	Weigh-in in g		ICP no.	Comment						
B1		1	-		B1							
		2										
		3										
		4										
		5										
		6										
		7										
		8										
B2		9	-		B2							
		10										
		11										
		12										
		13										
		14										
		15										
		16										

Use plastic vessels in trace element analysis (see notes in the laboratory manuals)!

Aqua regia digestion for soil and sediment												
Order no.:		Project/experiment:						Client:				
Date of weigh-in:		Date of extraction:						Date of ICP measurement:				
Extracting agent in ml: HCl 6 HNO_3 2		Weigh-in: ≤ 0.5 g Volume: 100 ml						Date of disposal:				
Elements to be determined:		Al	Ca	Cd	Cu	Fe	K	Mg	Mn	Ni	P	Zn
tick												
Lab no.	Parallel	Microw. no.	Weigh-in in g		ICP no.		Comment					
B1		17	-		B1							
		18										
		19										
		20										
		21										
		22										
		23										
		24										
		25										
		26										
		27										
		28										
B2		29	-		B2							
		30										
		31										
		32										
		33										
		34										
		35										
		36										
		37										
		38										
		39										
		40										

Use plastic vessels in trace element analysis (see notes in the laboratory manuals)!

Total digestion for plants and peat with HNO_3 and H_2O_2												
Order no.:		Project/experiment:						Client:				
Date of weigh-in:		Date of extraction:						Date of ICP measurement:				
Extracting agent in ml: HNO_3 5 H_2O_2 (30 %) 3		Weigh-in: **0.100 g** (max. 0.5 g) Volume: **20 ml** (50 or 100 ml at higher concentrations)						Date of disposal:				
Elements to be determined:		Al	Ca	Cd	Cu	Fe	K	Mg	Mn	Ni	P	Zn
tick												
Lab no.	Parallel	Microw. no.	Weigh-in in g		ICP no.	Comment						
B1		1	-									
		2										
		3										
		4										
		5										
		6										
		7										
		8										
B2		9	-									
		10										
		11										
		12										
		13										
		14										
		15										
		16										

Use plastic vessels in trace element analysis (see notes in the laboratory manuals)!

Total digestion for plants and peat with HNO_3 and H_2O_2												
Order no.:		Project/experiment:						Client:				
Date of weigh-in:		Date of extraction:						Date of ICP measurement:				
Extracting agent in ml: HNO_3 5 H_2O_2 (30 %) 3		Weigh-in: **0.100 g** (max. 0.5 g) Volume: **20 ml** (50 or 100 ml at higher concentrations)						Date of disposal:				
Elements to be determined:		Al	Ca	Cd	Cu	Fe	K	Mg	Mn	Ni	P	Zn
tick												

Lab no.	Parallel	Microw. no.	Weigh-in in g	ICP no.	Comment
B1		17	-	B1	
		18			
		19			
		20			
		21			
		22			
		23			
		24			
		25			
		26			
		27			
		28			
B2		29	-	B2	
		30			
		31			
		32			
		33			
		34			
		35			
		36			
		37			
		38			
		39			
		40			

Use plastic vessels in trace element analysis (see notes in the laboratory manuals)!

Total digestion for plants, fish or mounting resin with HNO_3												
Order no.:		Project/experiment:						Client:				
Date of weigh-in:		Date of extraction:						Date of ICP measurement:				
Extracting agent: 10 ml HNO_3		Weigh-in: 0.1…0.5 g Volume: 100 ml						Date of disposal:				
Elements to be determined:		Al	Ca	Cd	Cu	Fe	K	Mg	Mn	Ni	P	Zn
tick												
Lab no.	Parallel	Microw. no.	Weigh-in in g		ICP no.	Comment						
B1		1	-									
		2										
		3										
		4										
		5										
		6										
		7										
		8										
B2		9	-									
		10										
		11										
		12										
		13										
		14										
		15										
		16										

Use plastic vessels in trace element analysis (see notes in the laboratory manuals)!

Total digestion for plants, fish or mounting resin with HNO_3												
Order no.:		Project/experiment:						Client:				
Date of weigh-in:		Date of extraction:						Date of ICP measurement:				
Extracting agent: 10 ml HNO_3		Weigh-in: 0.1…0.5 g Volume: 100 ml						Date of disposal:				
Elements to be determined:		Al	Ca	Cd	Cu	Fe	K	Mg	Mn	Ni	P	Zn
tick												
Lab no.	Parallel	Microw. no.	Weigh-in in g		ICP no.	Comment						
B1		17	-		B1							
		18										
		19										
		20										
		21										
		22										
		23										
		24										
		25										
		26										
		27										
		28										
B2		29	-		B2							
		30										
		31										
		32										
		33										
		34										
		35										
		36										
		37										
		38										
		39										
		40										

Use plastic vessels in trace element analysis (see notes in the laboratory manuals)!

Total digestion for animal charcoal with HNO_3 and H_2O_2												
Note: Use microwave program bone char with long digestion time!												
Order no.:		Project/experiment:						Client:				
Date of weigh-in:		Date of extraction:						Date of ICP measurement:				
Extracting agent in ml: HNO_3 5 H_2O_2 (30 %) 3		Weigh-in: 0.03…< 0.1 g Volume: 50 ml						Date of disposal:				
Elements to be determined:		Al	Ca	Cd	Cu	Fe	K	Mg	Mn	Ni	P	Zn
tick												
Lab no.	Parallel	Microw. no.	Weigh-in in g		ICP no.	Comment						
B1		1	-		B1							
		2										
		3										
		4										
		5										
		6										
		7										
		8										
B2		9	-		B2							
		10										
		11										
		12										
		13										
		14										
		15										
		16										

Use plastic vessels in trace element analysis (see notes in the laboratory manuals)!

Total digestion for animal charcoal with HNO_3 and H_2O_2											
Note: Use microwave program bone char with long digestion time!											
Order no.:		Project/experiment:						Client:			
Date of weigh-in:		Date of extraction:						Date of ICP measurement:			
Extracting agent in ml: HNO_3 5 H_2O_2 (30 %) 3		Weigh-in: 0.03…< 0.1 g Volume: 50 ml						Date of disposal:			
Elements to be determined:		Al	Ca	Cd	Cu	Fe	K	Mg	Mn	Ni	P	Zn
tick												

Lab no.	Parallel	Microw. no.	Weigh-in in g	ICP no.	Comment
B1		17	-	B1	
		18			
		19			
		20			
		21			
		22			
		23			
		24			
		25			
		26			
		27			
		28			
B2		29	-	B2	
		30			
		31			
		32			
		33			
		34			
		35			
		36			
		37			
		38			
		39			
		40			

Use plastic vessels in trace element analysis (see notes in the laboratory manuals)!

Miniature total digestion for animal charcoal with HNO_3 and H_2O_2												
Note: Use microwave program bone char with long digestion time!												
Order no.:		Project/experiment:					Client:					
Date of weigh-in:		Date of extraction:					Date of ICP measurement:					
Extracting agent in ml: HNO_3 1,7 H_2O_2 (30 %) 1		for single-KK-particles 1…4 mm Weigh-in: < 0.03 g Volume: 20 or 50 ml					Date of disposal:					
Elements to be determined:		Al	Ca	Cd	Cu	Fe	K	Mg	Mn	Ni	P	Zn
tick												
Lab no.	Parallel	Microw. no.	Weigh-in in g		ICP no.	Comment						
B1		1	-		B1							
		2										
		3										
		4										
		5										
		6										
		7										
		8										
B2		9	-		B2							
		10										
		11										
		12										
		13										
		14										
		15										
		16										

Use plastic vessels in trace element analysis (see notes in the laboratory manuals)!

Miniature total digestion for animal charcoal with HNO_3 and H_2O_2												
Note: Use microwave program bone char with long digestion time!												
Order no.:		Project/experiment:					Client:					
Date of weigh-in:		Date of extraction:					Date of ICP measurement:					
Extracting agent in ml: HNO_3 1,7 H_2O_2 (30 %) 1		for single-KK-particles 1…4 mm Weigh-in: < 0.03 g Volume: 20 or 50 ml					Date of disposal:					
Elements to be determined:		Al	Ca	Cd	Cu	Fe	K	Mg	Mn	Ni	P	Zn
tick												
Lab no.	Parallel	Microw. no.	Weigh-in in g		ICP no.		Comment					
B1		17	-		B1							
		18										
		19										
		20										
		21										
		22										
		23										
		24										
		25										
		26										
		27										
		28										
B2		29	-		B2							
		30										
		31										
		32										
		33										
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		35										
		36										
		37										
		38										
		39										
		40										

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