



**BUREAU
VERITAS**

MINERALS

► MA300, MA200

Package Description	Geochemical Four-Acid Digestion
Samples Digestion	HF-HNO ₃ -HClO ₄ acid digestion
Instrumentation Method	ICP-ES (MA300, MA200), ICP-MS (MA200)
Legacy Code	1E, 1EX
Applicability	Sediment, Soil, Non-mineralized Rock and Drill Core

► METHOD DESCRIPTION

Prepared sample is digested to complete dryness with an acid solution of (2:2:1:1) H₂O-HF-HClO₄-HNO₃. 50% HCl is added to the residue and heated using a mixing hot block. After cooling the solutions are transferred to test-tubes and brought to volume using dilute HCl. Sample splits of 0.25g are analyzed.

ELEMENT	MA300 DETECTION	MA200 DETECTION	UPPERLIMIT
Ag	0.5 ppm	0.1 ppm	200 ppm
Al*	0.01%	0.01%	20%
As†	5 ppm	1 ppm	10000 ppm
Ba*	1ppm	1 ppm	10000 ppm
Be*	1 ppm	1 ppm	1000 ppm
Bi	5 ppm	0.1 ppm	4000 ppm
Ca	0.01%	0.01%	40%
Cd	0.4 ppm	0.1 ppm	4000 ppm
Ce	-	1 ppm	2000 ppm
Co	2 ppm	0.2 ppm	4000 ppm
Cr	2 ppm	1 ppm	10000 ppm
Cu	2 ppm	0.1 ppm	10000 ppm
Fe*	0.01%	0.01%	60%
Hf*	-	0.1 ppm	1000 ppm
In	-	0.05 ppm	1000 ppm
K	0.01%	0.01%	10%
La	2 ppm	0.1 ppm	2000 ppm
Li	-	0.1 ppm	2000 ppm
Mg*	0.01%	0.01%	30%
Mn*	5 ppm	1 ppm	10000 ppm
Mo	2 ppm	0.1 ppm	4000 ppm
Na	0.01%	0.001%	10%
Nb	2 ppm	0.1 ppm	2000 ppm

ELEMENT	MA300 DETECTION	MA200 DETECTION	UPPERLIMIT
Ni	2ppm	0.1 ppm	10000 ppm
P	0.002%	0.001%	5%
Pb	5 ppm	0.1 ppm	10000 ppm
Re	-	0.005 ppm	100 ppm
Rb	-	0.1 ppm	2000 ppm
S*	0.1%	0.1%	10%
Sb†	5 ppm	0.1 ppm	4000 ppm
Sc	1 ppm	1 ppm	200 ppm
Se	-	1 ppm	1000 ppm
Sn*	2 ppm	0.1 ppm	2000 ppm
Sr	2 ppm	1 ppm	10000 ppm
Ta*	-	0.1 ppm	2000 ppm
Te	-	0.5 ppm	1000 ppm
Th	2 ppm	0.1 ppm	4000 ppm
Ti	0.01%	0.001%	10%
Tl	-	0.5 ppm	10000 ppm
U	20 ppm	0.1 ppm	4000 ppm
V	2 ppm	4 ppm	10000 ppm
W*	4 ppm	0.1 ppm	200 ppm
Y	2 ppm	0.1 ppm	2000 ppm
Zn	2 ppm	1 ppm	10000 ppm
Zr*	2 ppm	0.1 ppm	2000 ppm

Limitations: *This digestion is only partial for some Cr and Ba minerals and some oxides of Al, Hf, Mn, Sn, Ta and Zr. †Volatilization may occur during fuming resulting in some loss of As, and Sb

