Bundesforschungs- und Ausbildungszentrum
für Wald, Naturgefahren und Landschaft
Austrian Research and Training Centre for Forests, Natural Hazards and Landscape | http://bfw.ac.at

Reference Sample – *Spruce needles* B (Austria)

(used in the 19th Needle/Leaf Interlaboratory Test as Sample 2)

Element concentration calculated on dry mass (105°C).

Element	N/L	Unit	Mean	S_R
N	140/35	mg/g	14.20	0.376
S	136/34	mg/g	0.94	0.047
P	156/39	mg/g	2.01	0.121
Ca	160/40	mg/g	5.83	0.339
Mg	156/39	mg/g	1.07	0.058
K	156/39	mg/g	7.28	0.413
Zn	127/32	µg/g	32.70	2.574
Mn	128/32	µg/g	359.3	22.689
Fe	124/31	µg/g	73.73	8.568
Cu	128/32	µg/g	3.16	0.441
Pb	56/14	µg/g	0.08	0.034
Cd	76/19	ng/g	28.14	3.283
B	68/17	µg/g	12.06	1.320
C	135/34	g/100g	51.98	1.152
As	32/8	ng/g	20.53	4.957
Co	64/16	µg/g	0.29	0.020
Cr	88/22	µg/g	4.24	0.637
Hg	52/13	ng/g	28.27	6.501
Mo	32/8	ng/g	291.6	31.109
Ni	90/23	µg/g	2.26	0.268
Tl	24/6	ng/g	5.12	0.896
V	36/9	µg/g	0.063	0.008

N …….. Outlier free single values
L …….. Number of laboratories without outliers type 2
Mean … Total mean value from all results without outliers
S_R … Standard deviation from all outlier free results
$S_{mean} = \frac{S_R}{\sqrt{N}}$ Standard error of the mean

A homogeneity test was made with 250 mg sample material – the recommended minimum sample intake is therefore 250 mg.