

April 1, 2012
Seishin Trading Co., Ltd.

JSAC Reference materials

(Manufacturer: Japan Society for Analytical Chemistry)

▷ Environment (Plastics)

JSAC CRM 0601-3 (chips)

Plastics (polyester) for Chemical Analysis (50g)				
Elements	Cd	Cr	Hg	Pb
Certified values	5.0	11.3	1.3	12.1
mass fraction (mg/kg)				

JSAC CRM 0602-3 (chips)

Plastics (polyester) for Chemical Analysis (50g)				
Elements	Cd	Cr	Hg	Pb
Certified values	50.4	112.6	12.1	112.0
mass fraction (mg/kg)				

JSAC CRM 0611 – 0615 (disk)

Plastics (polyester) for Fluorescent X-ray Analysis (40mm dia. x 4.0mm thick.: 5 pcs / set)						
CRM	Elements	Certified value				
JSAC 0611 (for blank test)	Pb	Reference value	Less than 1			
	Cd	Reference value	Less than 1			
	Cr	Reference value	Less than 1			
JSAC 0612	Pb	26.1				
	Cd	4.5				
	Cr	25.5				
JSAC 0613	Pb	54.6				
	Cd	10.0				
	Cr	52.0				
JSAC 0614	Pb	106.8				
	Cd	23.8				
	Cr	98.6				
JSAC 0615	Pb	202.2				
	Cd	43.4				
	Cr	212.8				
mass fraction (mg/kg)						

JSAC CRM 0621 - 0625 (disk)

Plastics (polyester) for Fluorescent X-ray Analysis of Trace Mercury (40mm dia. x 4.0mm thick.: 5 pcs / set)		
CRM	Elements	Certified value
JSAC 0621 (for blank test)		Reference value Less than 1
JSAC 0622	Hg	10.0
JSAC 0623	Hg	49.0
JSAC 0624	Hg	121.1
JSAC 0625	Hg	244.4

mass fraction (mg/kg)

JSAC CRM 0631 and JSAC CRM 0632 (disk)

Plastics (polyester) for Fluorescent X-ray Analysis (40mm dia. x 4.0mm thick.: 2 pcs / set)		
CRM	Elements	Certified value
JSAC 0631	Pb	24.5
	Cd	22.5
	Cr	25.8
	Hg	19.7
JSAC 0632	Pb	92.9
	Cd	46.1
	Cr	93.3
	Hg	59.4

mass fraction (mg/kg)

JSAC CRM 0651 - JSAC CRM 0655 (disk)

Plastics (polyester) for Fluorescent X-ray Analysis of Bromine (40mm dia. x 4.0mm thick.: 5 pcs / set)		
CRM	Elements	Certified value
JSAC 0651 (for blank test)	Br	Reference value Less than 1
JSAC 0652	Br	105.8
JSAC 0653	Br	292.6
JSAC 0654	Br	595
JSAC 0655	Br	993

mass fraction (mg/kg)

JSAC CRM 0641 and JSAC CRM 0642 (chips)

Plastics (PBDEs) for Chemical Analysis (each 25g)		
CRM	Elements	Certified value
JSAC 0641	Deca	27.2
	Nona	21.1
	Octa	46.9
	Hepta	60.0
	Hexa	16.4
	Penta	28.2
	Tetra	18.7
	Br	170
JSAC 0642	Deca	137
	Nona	113
	Octa	287
	Hepta	361
	Hexa	75
	Br	795

mass fraction ($\mu\text{ g/g}$)

▷ *Environment (Soil)*

JSAC CRM 0401 (Added): Metallic components in brown forest soil (50g)

JSAC CRM 0411: Metallic components in volcanic ash soil (50g)

Element	Concentration (mg/kg)	
	JSAC 0401	JSAC 0411
Cd	4.25 \pm 0.41	0.274 \pm 0.023
Pb	26 \pm 4	18.9 \pm 2.6
Cr	50.4 \pm 5.1	23.5 \pm 1.8
As	10.62 \pm 0.65	11.3 \pm 0.5
Se	0.27 \pm 0.05	1.32 \pm 0.27
Be	5.28 \pm 0.35	1.04 \pm 0.23
Cu	15.3 \pm 1.3	26.7 \pm 1.1
Zn	66.8 \pm 2.7	64.6 \pm 2.0
Ni	18.9 \pm 1.3	11 \pm 1
Mn	266 \pm 9	943 \pm 28
V	65.0 \pm 2.6	68.6 \pm 3.5

JSAC CRM 0402: Inorganic components in brown forest soil
 (including analysis of 1 mol/L HCl extract) (50g)

JSAC CRM 0403: Inorganic components in brown forest soil
 (including analysis of 1 mol/L HCl extract) (50g)

Element	Concentration (mg/kg)	
	JSAC 0402	JSAC 0403
Cd	18.5 ± 1.1	183 ± 7
Pb	45.2 ± 7.1	224 ± 13
As	41.6 ± 3.2	199 ± 15
T-Cr	90.5 ± 6.9	257 ± 9
Se	17.0 ± 1.7	169 ± 13
Cu	31.3 ± 1.8	26.2 ± 0.9
Zn	100.7 ± 5.5	91.8 ± 2.9
Ni	29.8 ± 2.3	26.2 ± 2.3
Mn	265 ± 24	252 ± 23
V	119.3 ± 8.8	101 ± 7
Hg	1.3 ± 0.1	11.1 ± 1.0
B	115 ± 15	269 ± 46
F	(132 ± 45)	269 ± 58

() non-certified value

JSAC CRM 0461-0466: Hazardous metallic components in polluted soil
 (25g x 6 bottles)

Element	Concentration (mg/kg)					
	JSAC 0461	JSAC 0462	JSAC 0463	JSAC 0464	JSAC 0465	JSAC 0466
Cd	(0.30)	74.2 ± 1.9	146.8 ± 3.2	301.0 ± 8.4	607.4 ± 9.0	1199 ± 18
Pb	24.4 ± 1.1	73.7 ± 2.6	151.6 ± 5.1	302.7 ± 7.3	612.4 ± 12.5	1214 ± 25
As	21.53 ± 0.71	71.5 ± 2.8	137.6 ± 3.8	271.1 ± 8.7	550 ± 17	1093 ± 31
Se	(0.44)	71.6 ± 2.0	141.5 ± 3.4	291.9 ± 5.5	587 ± 13	1175 ± 25
Cr	97.2 ± 6.8	149.6 ± 8.5	244 ± 10	499 ± 21	738 ± 15	1483 ± 22
Hg	0.075 ± 0.008	7.27 ± 0.23	14.76 ± 0.54	28.6 ± 1.0	57.8 ± 1.8	113.5 ± 5.3

() non-certified value

▷ Environment (Coal)

JSAC CRM 0521: Inorganic components in coal ash (domestic) (50g)

JSAC CRM 0522: Inorganic components in coal ash (foreign) (50g)

Element	JSAC 0521	JSAC 0522
Main elements Concentration (%)		
Si	27.16 ± 0.31	27.76 ± 0.30
Al	13.48 ± 0.22	15.20 ± 0.29
Fe	3.09 ± 0.07	2.92 ± 0.05
Na	0.48 ± 0.02	0.13 ± 0.01
K	1.99 ± 0.09	0.24 ± 0.01
Mg	0.87 ± 0.02	0.36 ± 0.01
Ca	1.31 ± 0.02	0.93 ± 0.02
P	0.400 ± 0.010	0.146 ± 0.005
Sr	0.113 ± 0.004	0.122 ± 0.004
Ti	0.65 ± 0.01	1.03 ± 0.02
C	1.21 ± 0.03	1.03 ± 0.01
S	0.066 ± 0.004	0.067 ± 0.004
LOI	1.47 ± 0.05	1.36 ± 0.04
Trace elements Concentration (mg/kg)		
As	19.7 ± 1.3	55.2 ± 3.5
B	148 ± 10	85.6 ± 6.7
Be	3.03 ± 0.31	10.4 ± 0.7
Cd	(0.46 ± 0.13)	0.98 ± 0.13
Co	27.8 ± 4.1	47.4 ± 6.2
Cr	102 ± 4	139 ± 5
Cu	103 ± 4	113 ± 5
F	153 ± 7	(33 ± 13)
Hg	0.14 ± 0.01	(<0.01)
Mn	315 ± 11	240 ± 8
Ni	62.8 ± 2.0	106 ± 5
Pb	54.0 ± 4.4	98.1 ± 5.8
Se	0.75 ± 0.10	(<0.1)
V	225 ± 6	130 ± 7
Zn	137 ± 8	303 ± 19

() non-certified value

▷ *Environment (Dioxins)*

JSAC CRM 0501: Dioxins in fly-ash (high concentration) (50g)

JSAC CRM 0502: Dioxins in fly-ash (low concentration) (50g)

Element	TEQ (ng/g)	
	JSAC 0501	JSAC 0502
PCDDs + PCDFs	2.58 ± 0.18	0.930 ± 0.062
DL-PCBs	0.0243 ± 0.0015	0.0174 ± 0.0014
Total	2.61 ± 0.18	0.947 ± 0.065

JSAC CRM 0511: Dioxins in combustion dust (high concentration) (60g)

JSAC CRM 0512: Dioxins in combustion dust (low concentration) (60g)

Element	TEQ (pg/g)	
	JSAC 0511	JSAC 0512
PCDDs + PCDFs	806 ± 23	140.6 ± 8.8
DL-PCBs	17.54 ± 0.84	2.84 ± 0.14
Total	824 ± 23	143.5 ± 4.2

JSAC CRM 0421: Dioxins in soil (low concentration) (60g)

JSAC CRM 0422: Dioxins in soil (high concentration) (60g)

Element	TEQ (pg/g)	
	JSAC 0421	JSAC 0422
PCDDs + PCDFs	37.3 ± 3.6	112 ± 11
DL-PCBs	4.10 ± 0.58	11.8 ± 1.8
Total	41.4 ± 3.9	124 ± 11

JSAC CRM 0431: Dioxins in river sediment (low concentration) (60g)

JSAC CRM 0432: Dioxins in river sediment (high concentration) (60g)

Element	TEQ (pg/g)	
	JSAC 0431	JSAC 0432
PCDDs + PCDFs	45.1 ± 2.2	63.7 ± 3.5
DL-PCBs	9.2 ± 1.0	13.9 ± 0.99
Total	54.3 ± 2.9	78.7 ± 4.1

JSAC CRM 0451: Dioxins in marine sediment (low concentration) (60g)

JSAC CRM 0452: Dioxins in marine sediment (high concentration) (60g)

Element	TEQ (pg/g)	
	JSAC 0451	JSAC 0452
PCDDs + PCDFs	14.17 ± 0.50	58.8 ± 1.9
DL-PCBs	2.87 ± 0.14	16.59 ± 0.52
Total	17.03 ± 0.69	75.4 ± 2.6

JSAC CRM 0311: Dioxins in wastewater (3L × 2 bottles / set)

JSAC CRM 0321: Dioxins in Synthesized wastewater (3L × 2 bottles / set)

Element	TEQ (pg/g)	TEQ (pg/L)
	JSAC 0311	JSAC 0321
PCDDs + PCDFs	12.50 ± 0.50	41.0 ± 1.8
DL-PCBs	Sold Out	5.46 ± 0.25
Total	13.81 ± 0.61	46.5 ± 1.9

▷ Foodstuff

JSAC PT0711: Nutrient constituents in dry milk (50g)

JSAC PT0711			
Element	(g / 100g)	Element	(mg / 100g)
Protein	26.53	Calcium	920
Total fat	25.10	Iron	(0.19)
Ash	5.76	Sodium	315
		phosphorus	738

() non-certified value

JSAC PT0721: Nutrient constituents in Fish sausage (100g × 2 bottles / set)

JSAC PT0721			
Element	(g / 100g)	Element	(mg / 100g)
Protein	8.71	Calcium	442
Total fat	Sold Out		(0.43)
Ash	5.10	Sodium	797
		phosphorus	76.3

() non-certified value

▷ *Material*

JSAC CRM 0111: Trace oxygen in steel

Element	(μ g/g)	Size
Oxygen	2.3 \pm 0.4	32 mm dia. \times 30 mm length

Note: Concentration of trace oxygen in bearing steel was certified by means of charged particle radiation method that is not affected from surface oxygen.

JSAC CRM 0121-B: Trace impurities in aluminum (Block)

JSAC CRM 0121-C: Trace impurities in aluminum (Chips)

Element	JSAC 0121-B	JSAC 0121-C
	25mm \times 25 mm \times 15 mm	Chips (50g)
Si	11.0 \pm 0.6	11.0 \pm 0.6
Fe	9.4 \pm 0.3	9.4 \pm 0.3
Cu	3.48 \pm 0.11	3.48 \pm 0.11
Mn	1.73 \pm 0.06	1.73 \pm 0.06
Mg	2.82 \pm 0.13	2.82 \pm 0.13
Zn	2.03 \pm 0.15	2.03 \pm 0.15
Ti	1.96 \pm 0.07	1.96 \pm 0.07
Cr	1.13 \pm 0.06	1.13 \pm 0.06
Zr	2.02 \pm 0.13	2.02 \pm 0.13
B	1.98 \pm 0.11	1.98 \pm 0.11

JSAC CRM 0131 – 0134 (disk)

Lead-free Solder Alloy					
(Size with resin 40mm dia. \times 4.0mm thick.: 4pcs / set)					
(Solder part: 30mm dia. \times 2.20mm thick)					
CRM	Element	Certified value	CRM	Element	Certified value
JSAC 0131	Pb	13.9 \pm 0.7	JSAC 0133	Pb	1021 \pm 21
	Cd	(<3)		Cd	830 \pm 10
	Ag	0.488 \pm 0.007		Ag	3.41 \pm 0.02
	Cu	0.102 \pm 0.002		Cu	0.756 \pm 0.009
JSAC 0132	Pb	517.7 \pm 8.5	JSAC 0134	Pb	2004 \pm 26
	Cd	87.3 \pm 2.8		Cd	1530 \pm 17
	Ag	2.98 \pm 0.02		Ag	3.91 \pm 0.03
	Cu	1.01 \pm 0.02		Cu	0.513 \pm 0.009

mass fraction (Pb, Cd: mg/kg; Ag, Cu: %)