

THE INSTITUTE FOR CERTIFIED REFERENCE MATERIALS ICRM

CERTIFICATE OF ANALYSIS

CERTIFIED REFERENCE MATERIAL
No. C1/3

PURE IRON

CERTIFIED VALUES AND UNCERTAINTIES (95% confidence level), %

Carbon	0.0036	± 0.0003	Sulphur	0.0034	± 0.0002
Silicon	0.0099	± 0.0005	Phosphorus	0.0012	± 0.0002
Manganese	0.0023	± 0.0002	Arsenic	0.00026	± 0.00003
Chromium	0.0064	± 0.0004	Titanium	0.00017	± 0.00003
Nickel	0.0042	± 0.0003	Nitrogen	0.027	± 0.001
Molybdenum	0.00029	± 0.00003	Zinc	0.00026	± 0.00002
Cobalt	0.0006	± 0.0001	Tin	0.00023	± 0.00003
Copper	0.0033	± 0.0002	Lead	0.00010	± 0.00001
Aluminium	0.018	± 0.001			

ADDITIONAL DATA: Minimum weight of sample for analysis is 0.1 g.
Analytical methods used are given in Supplement.

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CERTIFIED REFERENCE MATERIAL

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PURE IRON (continuation)

SUPPLEMENT

ANALYTICAL METHODS USED

CARBON	Infra-red absorption spectrometry.
SILICON	Photometry, as blue Si-Mo complex, reduction by iron (II) –ions, or by ascorbic acid. ICP-AES.
MANGANESE	Inversion - voltamperometric method. Photometry, oxidation by potassium periodate.AAS. ICP-AES.
CHROMIUM	Photometry, with diphenilcarbazide. ICP-AES.
NICKEL	Photometry, with dimethylglyoxime, after extraction separation. Photometry, with dimethylglyoxime. AAS. ICP-AES.
MOLYBDENIUM	Extraction- photometry, with zinc-dithiol. ICP-AES. ICP-MS. Inversion -voltamperometric method.
COBALT	Photometry, with nitrozo-R salt.AAS. ICP-AES. ICP-MS.
COPPER	Inversion -voltamperometric method. AAS. ICP-AES. Extraction -photometry, with sodium diethyl dithiocarbamate.
ALUMINIUM	Photometry, with aluminon, or with chromazurol S. AAS. ICP-AES.
SULPHUR	Coulometry. Infra-red absorption spectrometry. Photometry with DMPFDA.
PHOSPHORUS	Photometry, as blue P-Mo complex, reduction by ascorbic acid with potassium antimonyl tartrate. Extraction -photometry, as blue P-Mo complex, reduction by stannous chloride. ICP-AES
ARSENIC	Photometry, as blue As-Mo complex, reduction by ascorbic acid. AAS. ICP-AES. ICP-MS. AAS with ETA. AAS with GG.
TITANIUM	Photometry, with diantipyrylmethane. Extraction - photometry, with diantipyrylmethane. ICP-AES. ICP-MS.
NITROGEN	Distillation / acidimetry. Thermo conductometric method. Photometry, with bispirazonon. Regenerative fusion in inert gas.
TIN	Inversion - voltamperometric method. ICP-AES. ICP-MS. AAS with ETA. AAS with GG.
ZINC	Inversion - voltamperometric method. AAS. ICP-AES. ICP-MS.
LEAD	Inversion - voltamperometric method. AAS. ICP-AES. ICP-MS. AAS with ETA.