Certified Reference Material

Jernkontoret

Certificate

JK 39

Ferrosilicon

JK 39 is certified for nine elements.

Material supplier: Elkem A/S, Oslo, Norway*

JK 39 is available in the form of powder in bottles containing 50 gram.

Certified values (mass content in % m/m).

	C	Si	Mn	P	Cu	Al	Ti	Ca	Fe
M_M	**0.105**	**75.9**	**0.165**	**0.018**	**0.013**	**1.45**	**0.116**	**0.24**	**21.6**
s_M	0.005	0.27	0.005	0.002	0.002	0.02	0.005	0.008	0.28
C (95%)	0.005	0.23	0.005	0.002	0.002	0.02	0.005	0.008	0.30

Approximate concentrations *(mass content in %, m/m)*

Ni	*Cr*	*Co*	*Mg*	*Zn*	*B*	*V*	*As*
0.008	*0.01*	*0.002*	*0.01*	*0.001*	*0.007*	*0.007*	*0.003*

JK 39 should be used for calibration of analytical instruments and for control of analytical methods. The CRM should be stored in a dry and clean atmosphere.
The analytical methods used are calibrated against pure metals or stoichiometric chemical compounds in order to guarantee traceability.

The reference material is prepared and issued by:

Swedish Institute for Metals Research (SIMR)
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SP ISO 9001 Certifierad

Certified Institute

GAZ GAZ-P-02-02-01-11-01

ISO 17025
Accredited Laboratory

Laboratory means (mass content in % (m/m))

Lab	C	Si	Mn	P	*S*	Cu	Al	Ti	Ca	Fe	*Ni*	*Cr*	*Co*	*Mg*	*Zn*	*B*	*V*	*As*	*Sb*	*Bi*
1	0.096	75.60	0.160	0.0170	*0.0002*	0.010	1.42	0.109	0.220	21.10	*0.006*	*0.012*	*0.001*	*0.012*	*0.0007*	*0.007*	*0.006*	*0.0003*	*<0.0001*	*<0.0001*
2	0.103	75.60	0.160	0.0170	*0.0006*	0.010	1.44	0.110	0.230	21.30	*0.007*	*0.013*	*0.002*	*0.014*	*0.0010*		*0.007*			
3	0.105	75.70	0.160	0.0174	*<0.001*	0.012	1.45	0.114	0.235	21.60	*0.009*	*0.013*	*0.004*							
4	0.105	75.90	0.165	0.0180	*0.0020*	0.013	1.46	0.115	0.240	21.70	*0.010*	*0.016*								
5	0.105	75.95	0.170	0.0180	*0.0020*	0.013	1.46	0.116	0.240	21.74										
6	0.106	76.00	0.171	0.0180		0.014	1.47	0.116	0.240	21.78										
7	0.113	76.17	0.171	0.0183		0.014	1.48	0.123	0.245											
8		76.35		0.0220																
M_M	**0.105**	**75.90**	**0.165**	**0.0180**		**0.013**	**1.45**	**0.116**	**0.240**	**21.60**										
s_M	0.005	0.269	0.005	0.0020		0.0020	0.020	0.005	0.008	0.275										

M_M: Mean of the interlaboratory means

s_M: Standard deviation of the interlaboratory means

Participating laboratories*:

Avesta Jernverks AB, Avesta, Sweden
Bremanger Smelteverk, Svelgen, Norway
Fagersta AB, Fagersta, Sweden
Fiskaa Verk, Vaagsbygd, Norway
Rautaruukki Oy, Raahensalo, Finland
Saltenverk, Straummen, Norway
Sandvik AB, Sandviken, Sweden
SKF Steel, Hellefors, Sweden

**The names of laboratories are the original ones, which means the names at the time for certification in 1987.*

Stockholm, August 2003
Nordic CRM Working Group

Sven Sundberg
Research Manager, Jernkontoret

Ingemar Gustavsson
Chairman