

TiO ₂	a. Diantipyrylmethane spectrophotometry b. Tiron spectrophotometry c. Chromotropic acid spectrophotometry
F	a. Ion selective electrode analysis b. Alizarin Complexone spectrophotometry after distillation separation of F c. Xylenol Orange zirconium spectrophotometry d. Titrimetry with thorium nitrate after spectrophotometry of F e. Zirconium alizarin sulphionate spectrophotometry after separation of F
CO ₂	a. Gravimetry of CO ₂ b. Volumetric analysis of CO ₂ c. Non-water titrimetry d. Titrimetry after absorption with barium hydrate
K ₂ O	a. AAS b. Flame emission spectrophotometry c. Sodium tetraphenylboron titrimetry
Na ₂ O	a. AAS b. Flame emission spectrophotometry
SrO	a. AAS b. XRF c. ICP-ES
I	a. Iodic blue spectrophotometry b. Ion selective electrode analysis c. Spectrophotometry after xylene extraction of I
Ts	a. Gravimetry of barium sulfate

Certificate of Certified Reference Material


NCS DC 79001 — NCS DC 79003

Phosphate Rock
(Phosphorite)

Reissued in 2014

Approved by China National Analysis Center for Iron and Steel

(Beijing China)



Professor Wang Haizhou, Chief
China National Analysis Center for Iron and Steel

Certified Values and Uncertainty										
No.		Chemical composition (%)								
		P ₂ O ₅	SiO ₂	CaO*	MgO	Fe ₂ O ₃ **	Al ₂ O ₃	MnO	Ts	U%
NCS DC 79001	Certified Values	36.89	3.26	51.32	0.43	1.04	0.58	0.024		(0.0011)
	Standard Deviation	0.07	0.05	0.13	0.02	0.03	0.04	0.002		
NCS DC 79002	Certified Values	20.86	3.61	40.71	8.19	1.08	2.58	0.015	0.79	(0.0027)
	Standard Deviation	0.06	0.04	0.15	0.06	0.02	0.06	0.002	0.03	
NCS DC 79003	Certified Values	6.06	38.80	19.42	7.12	3.08	4.06	0.026		(0.00008)
	Standard Deviation	0.03	0.08	0.08	0.09	0.03	0.06	0.002		
		TiO ₂	F	CO ₂	K ₂ O	Na ₂ O	SrO	I	H ₂ O ⁺ %	
NCS DC 79001	Certified Values	0.037	3.54	2.15	0.17	0.33	0.077	0.0052	(1.25)	
	Standard Deviation	0.002	0.05	0.07	0.02	0.02	0.003	0.0005		
NCS DC 79002	Certified Values	0.14	2.05	18.46	0.28	0.059	0.16	0.0059	(1.56)	
	Standard Deviation	0.007	0.05	0.14	0.02	0.010	0.007	0.0004		
NCS DC 79003	Certified Values	0.48	0.51	16.41	2.63	0.14	0.055		(1.23)	
	Standard Deviation	0.02	0.03	0.10	0.05	0.02	0.003			

Note:

- *including SrO, **computed from TFe. The value of U and H₂O⁺ is for reference only.
- Certified values are calculated according to analytical results of 12 independent laboratories.
- The sample is packed in glass bottle. The minimum package is 100 grams.
- The sample should be stored in dry place. It should be stoved at 105°C for 2 hours before use.

Size of the sample			
Percent \ No.	-160 meshes%	-200 meshes%	-300 meshes%
NCS DC 79001	98.6	94.2	89.7
NCS DC 79002	98.0	96.0	93.8
NCS DC 79003	99.4	98.3	95.1

Analytical Methods	
P ₂ O ₅	a. Quinoline-phosphomolybdate gravimetry b. Quinoline-phosphomolybdate volumetry c. Molybdovanadophosphate sepectrophotometry d. Magnesium pyrophosphate gravimetry
SiO ₂	a. Gravimetry b. Silicomolybdic blue spectrophotometry c. Potassium silicofluoride volumetry
CaO	a. Gravimetry after calcium separated as oxalate b. Complex titrimetry c. Titrimetry of the calcium oxalate with potassium permanganate
MgO	a. AAS b. Titrimetry with EDTA c. Chlorlphosphonazo I spectrophotometry d. Azophenol spectrophotometry e. Magnesium pyrophosphate gravimetry f. Titan yellow spectrophotometry g. ICP-ES
Fe ₂ O ₃	a. 1.10-phenanthroline spectrophotometry b. Sulfosalicylic acid spectrophotometry c. AAS d. Titrimetry with potassium dichromatelindicator changed e. Titrimetry with EDTA f. Titrimetry with mercurous nitrate
AL ₂ O ₃	a. Complex titrimetry b. Chrome azurol S spectrophotometry c. Chrome azurol S-CTMAB spectrophotometry d. Xylenol Orange spectrophotometry e. ICP-ES f. AAS
MnO	a. Spectrophotometry as permanganate b. AAS c. ICP-ES d. PAN spectrophotometry e. X-ray fluorescene analysis