

**ARL 9900 X-Ray Spectrometer**  
2500W – Rh anode X-ray tube

**PRECISION FOR FERRO-ALLOYS APPLICATION**

Samples prepared in the form of pressed powders.  
**Analysis on goniometer**

<b>ARL 9900 at 2500W</b>			
<b>Ferro-Mn</b> Pressed pellets			
<b>Element</b>	<b>Concentration (%)</b>	<b>Typical precision, % (10s) ± (<math>\Delta=2\sigma</math>)</b>	<b>Guaranteed precision, % (10s) ± (<math>\Delta=2\sigma</math>)</b>
Al	0.175	0.0029	0.0058
Si	0.369	0.0077	0.0154
P	0.156	0.0064	0.0129
S	0.008	0.0006	0.0012
Ca	0.002	0.0004	0.0007
V	0.147	0.0017	0.0034
Cr	0.066	0.0012	0.0025
Mn	87	0.0713	0.1427
Fe	11.4	0.0684	0.1368
Cu	0.058	0.0016	0.0032
Ni	0.114	0.0026	0.0052
Mo	0.009	0.0007	0.0013
Sn	0.058	0.0039	0.0078

- Notes:
- Precision is repeatability for 10 consecutive analyses of the same pressed pellet.
  - Above precision data are expressed as **2 sigma** data.
  - Pressed pellets with 10% methyl-cellulose binder
  - Precision for fixed channels will be equal or better to the goniometer
  - We do not guarantee accuracy as it is too dependant on the sample preparation
  - Fe content is calculated by difference

<b>ARL 9900 at 2500W</b>			
<b>Si-Mn</b> Pressed pellets			
<b>Element</b>	<b>Concentration (%)</b>	<b>Typical precision, % (10s) <math>\pm (\Delta=2\sigma)</math></b>	<b>Guaranteed precision, % (10s) <math>\pm (\Delta=2\sigma)</math></b>
Al	0.15	0.0021	0.0043
Si	35	0.078	0.157
P	0.033	0.0018	0.0036
S	0.004	0.0004	0.0008
Ca	0.038	0.0012	0.0024
Ti	0.336	0.0034	0.0067
V	0.07	0.0013	0.0025
Cr	0.052	0.0016	0.0032
Mn	62	0.04	0.08
Fe	1.79	0.061	0.122
Cu	0.025	0.0009	0.0018
Ni	0.008	0.0009	0.0019
Nb	0.001	0.0002	0.0005
Mo	0.008	0.0004	0.0008
Sn	0.068	0.003	0.006

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<b>ARL 9900 at 2500W</b>			
<b>Ferro-Nb</b> Pressed pellets			
<b>Element</b>	<b>Concentration (%)</b>	<b>Typical precision, % (10s) <math>\pm (\Delta=2\sigma)</math></b>	<b>Guaranteed precision, % (10s) <math>\pm (\Delta=2\sigma)</math></b>
Al	1.88	0.0331	0.0662
Si	0.65	0.0099	0.0198
P	0.074	0.0025	0.0050
S	0.023	0.0019	0.0038
Ca	0.011	0.0024	0.0048
Ti	0.54	0.0058	0.0117
V	0.008	0.0011	0.0021
Cr	0.28	0.0050	0.0100
Mn	2	0.0096	0.0192
Fe	27	0.0864	0.1728
Cu	0.042	0.0013	0.0027
Ni	0.016	0.0011	0.0022
Nb	62	0.0558	0.1116
Mo	0.17	0.0015	0.0030
Sn	0.184	0.0158	0.0316

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<b>ARL 9900 at 2500W</b>			
<b>Ferro-P</b> Pressed pellets			
<b>Element</b>	<b>Concentration (%)</b>	<b>Typical precision, % (10s) ± (<math>\Delta=2\sigma</math>)</b>	<b>Guaranteed precision, % (10s) ± (<math>\Delta=2\sigma</math>)</b>
Al	0.19	0.0038	0.0076
Si	1.7	0.0116	0.0231
P	17	0.0571	0.1142
S	0.03	0.0005	0.0009
Ca	0.044	0.0010	0.0020
Ti	0.43	0.0018	0.0036
V	0.05	0.0016	0.0032
Cr	0.15	0.0020	0.0040
Mn	0.52	0.0044	0.0087
Fe	78	0.0312	0.0624
Cu	0.17	0.0036	0.0071
Ni	0.064	0.0019	0.0039
Mo	0.022	0.0010	0.0021
Sn	0.06	0.0046	0.0091

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<b>ARL 9900 at 2500W</b>  <b>Ferro-Si</b> Pressed pellets			
<b>Element</b>	<b>Concentration (%)</b>	<b>Typical precision, % (10s) <math>\pm (\Delta=2\sigma)</math></b>	<b>Guaranteed precision, % (10s) <math>\pm (\Delta=2\sigma)</math></b>
Al	0.14	0.0017	0.0034
Si	75	0.216	0.432
P	0.007	0.001	0.002
S	0.002	0.0003	0.0006
Ca	0.037	0.0013	0.0025
Ti	0.013	0.0009	0.0018
Cr	0.034	0.0014	0.0027
Mn	0.12	0.0025	0.005
Fe	24	0.1104	0.2208
Cu	0.043	0.0017	0.0034
Ni	0.033	0.0011	0.0022
Nb	0.003	0.0003	0.0007
Mo	0.016	0.0005	0.001
Sn	0.133	0.0029	0.0059

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<b>ARL 9900 at 2500W</b>  <b>Ferro-V</b> Pressed pellets			
<b>Element</b>	<b>Concentration (%)</b>	<b>Typical precision, % (10s) <math>\pm (\Delta=2\sigma)</math></b>	<b>Guaranteed precision, % (10s) <math>\pm (\Delta=2\sigma)</math></b>
Al	0.2	0.0018	0.0037
Si	1.15	0.0161	0.0322
P	0.055	0.0019	0.0038
S	0.007	0.0004	0.0008
Ca	0.11	0.0013	0.0026
Ti	3.42	0.0092	0.0183
V	40	0.048	0.096
Cr	1.6	0.0048	0.0096
Mn	3.13	0.0213	0.0426
Fe	41	0.0492	0.0984
Cu	0.2	0.0052	0.0104
Ni	0.07	0.0018	0.0036
Nb	0.13	0.0023	0.0047
Mo	0.085	0.0011	0.0023
Sn	0.083	0.0066	0.0133

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  - We do not guarantee accuracy as it is too dependant on the sample preparation
  - Fe content is calculated by difference

<b>ARL 9900 at 2500W</b>  <b>Ferro-Ti</b> Pressed pellets			
<b>Element</b>	<b>Concentration (%)</b>	<b>Typical precision, % (10s) <math>\pm (\Delta=2\sigma)</math></b>	<b>Guaranteed precision, % (10s) <math>\pm (\Delta=2\sigma)</math></b>
Al	8	0.0634	0.1267
Si	1.7	0.0143	0.0286
P	0.036	0.002	0.004
S	0.029	0.0005	0.001
Ca	0.045	0.001	0.0021
Ti	38	0.0578	0.1155
V	0.46	0.0029	0.0059
Cr	0.3	0.0060	0.0120
Mn	1.2	0.0053	0.0106
Fe	50	0.07	0.14
Cu	0.055	0.0023	0.0046
Ni	0.026	0.0009	0.0019
Nb	0.42	0.0026	0.0052
Mo	0.023	0.001	0.002
Sn	0.12	0.006	0.012

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  - Pressed pellets with 10% methyl-cellulose binder
  - Precision for fixed channels will be equal or better to the goniometer
  - We do not guarantee accuracy as it is too dependant on the sample preparation
  - Fe content is calculated by difference

<b>ARL 9900 at 2500W</b>  <b>Ferro-Cr</b> Pressed pellets			
<b>Element</b>	<b>Concentration (%)</b>	<b>Typical precision, % (10s) ± (<math>\Delta=2\sigma</math>)</b>	<b>Guaranteed precision, % (10s) ± (<math>\Delta=2\sigma</math>)</b>
Al	9.3	0.074	0.147
Si	0.64	0.009	0.018
S	0.016	0.0003	0.0006
Ca	0.013	0.0006	0.0013
Ti	0.055	0.0012	0.0025
V	0.04	0.0011	0.0022
Cr	72	0.0648	0.1296
Mn	0.24	0.002	0.004
Fe	17	0.068	0.136
Ni	0.08	0.0016	0.0032
Nb	0.003	0.0008	0.0015
Mo	0.005	0.0007	0.0015
Sn	0.062	0.0040	0.0081

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  - Pressed pellets with 10% methyl-cellulose binder
  - Precision for fixed channels will be equal or better to the goniometer
  - We do not guarantee accuracy as it is too dependant on the sample preparation
  - Fe content is calculated by difference

<b>ARL 9900 at 2500W</b>  <b>Ferro-Mo</b> Pressed pellets			
<b>Element</b>	<b>Concentration (%)</b>	<b>Typical precision, % (10s) ± (<math>\Delta=2\sigma</math>)</b>	<b>Guaranteed precision, % (10s) ± (<math>\Delta=2\sigma</math>)</b>
Al	0.2	0.0037	0.0074
Si	0.32	0.0099	0.0197
P	0.028	0.0065	0.013
S	0.036	0.0045	0.0089
Cr	0.012	0.0027	0.0054
Fe	23	0.0736	0.1472
Cu	0.21	0.002	0.0039
Ni	0.028	0.0013	0.0026
Nb	0.084	0.002	0.004
Mo	75	0.075	0.15
Sn	0.016	0.0102	0.0205

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  - Pressed pellets with 10% methyl-cellulose binder
  - Precision for fixed channels will be equal or better to the goniometer
  - We do not guarantee accuracy as it is too dependant on the sample preparation
  - Fe content is calculated by difference