

Instructions for OES Spectrometer Lab Report

The report for the lab should be **typed by a computer** and consist of:

- i. A **Cover Page** with “Student Name”, “Student ID Number” and “Lab. Group”.
- ii. An **Introduction** that briefly introduces the concept of qualitative and quantitative analysis for metals, discusses its importance in quantitative characterization, and clearly states the aims of the experiment. A background section that briefly discusses
 - a. Quantitative analysis methods for metals in general.
 - b. Spark OES analysis in detail.
- iii. **Equipment & Materials** which were used in the experiment
- iv. An **Experimental Procedure** section that carefully summarizes the method used.
- v. A **Results & Discussion** section. Calculate the mean quantity and standard deviation for each element in each analysis given to your lab. group specifically. Explain and discuss the analysis results, try to find out the material given to your lab. group.
- vi. References (American Ceramic Society Style, complete citation).

Measure Date Time	Method Name	Type	Type Corr Sample Name								
01/12/2025 13:41:48	Cu-01-M	Unknown									
Sample Name											
Meas.	Zn	Pb	Sn	P	Mn	Fe	Ni	Si	Mg	Cr	
	%	%	%	%	%	%	%	%	%	%	
	1	37.24	1.18	0.0649	0.0035	0.0018	0.0683	0.0187	0.0110	0.00067	<0.00020
	2	37.50	1.23	0.0631	0.0033	0.0018	0.0655	0.0183	0.0116	0.00065	<0.00020
	3	37.33	1.20	0.0627	0.0027	0.0018	0.0665	0.0184	0.0096	0.00065	<0.00020
Meas.	Te	As	Sb	Cd	Bi	Ag	Co	Al	S	Be	
	%	%	%	%	%	%	%	%	%	%	
	1	<0.00030	0.0127	0.0425	0.0013	<0.00060	0.0046	0.0051	0.768	0.0020	<0.00010
	2	<0.00030	0.0124	0.0407	0.0013	<0.00060	0.0046	0.0050	0.759	0.0019	<0.00010
	3	<0.00030	0.0119	0.0411	0.0013	<0.00060	0.0046	0.0054	0.760	0.0018	<0.00010
Meas.	Zr	Au	B	C	Ti	Se	Nb	Pt	Bg	Cu	
	%	%	%	%	%	%	%	%		%	
	1	<0.00020	<0.00050	0.00022	0.0039	<0.00020	<0.00080	<0.00100	<0.0020		60.6
	2	<0.00020	<0.00050	0.00026	<0.00050	<0.00020	<0.00080	<0.00100	<0.0020		60.3
	3	<0.00020	<0.00050	0.00025	<0.00050	<0.00020	<0.00080	<0.00100	<0.0020		60.5

GROUP A

Measure Date Time	Method Name	Type	Type Corr Sample Name
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02/12/2025 08:54:08Ti-01-MUnknown

Sample Name

Meas.	Al	Sn	Zr	Mo	V	C	Si	Mn	Cr	Ni
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16.440.454<0.001000.00364.700.06710.06820.00250.00790.0076
26.410.438<0.001000.00364.680.06830.08160.00230.00780.0046
36.430.426<0.001000.00434.620.07240.08790.00250.00760.0099

Meas.	Fe	Cu	Nb	Pd	Y	Ru	Ti
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10.1610.01700.03160.01140.0075<0.005088.0
20.1600.01410.01030.01110.0077<0.005088.1
30.1590.00980.01050.01130.0080<0.005088.1

GROUP B

Measure Date Time	Method Name	Type	Type Corr Sample Name							
02/12/2025 13:47:44	AI-01-M	Unknown								
Sample Name										
Meas.	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag
	%	%	%	%	%	%	%	%	%	%
1	0.0557	0.0722	1.80	0.0089	1.89	0.0072	0.00061	5.81	0.0350	0.00089
2	0.0513	0.0720	1.71	0.0093	1.84	0.0074	<0.00040	5.83	0.0485	0.00087
3	0.0521	0.0923	1.79	0.0089	1.90	0.0073	0.00063	5.91	0.0354	0.00090
Meas.	B	Ba	Be	Bi	Ca	Cd	Ce	Co	Ga	Hg
	%	%	%	%	%	%	%	%	%	%
1	0.0024	<0.00010	0.00067	<0.00100	0.00019	0.0017	<0.0015	<0.00050	0.0051	0.0014
2	0.0020	<0.00010	0.00063	<0.00100	0.00028	0.0016	<0.0015	<0.00050	0.0053	0.0015
3	0.0017	<0.00010	0.00068	<0.00100	<0.00010	0.0017	<0.0015	<0.00050	0.0051	0.0014
Meas.	In	La	Li	Mo	Na	P	Pb	Sb	Sn	Sr
	%	%	%	%	%	%	%	%	%	%
1	<0.00030	<0.00030	<0.00010	0.0062	0.0022	0.0028	0.0042	<0.0030	<0.00050	<0.00010
2	<0.00030	<0.00030	<0.00010	0.0066	0.0017	0.0025	0.0038	<0.0030	<0.00050	<0.00010
3	<0.00030	<0.00030	<0.00010	0.0063	0.0023	0.0023	0.0042	<0.0030	<0.00050	<0.00010
Meas.	V	Zr	Sc	Bg	Al					
	%	%	%		%					
1	0.0085	0.0922	<0.0500		90.1					
2	0.0098	0.0996	<0.0500		90.2					
3	0.0084	0.0906	<0.0500		90.0					

GROUP C

Measure Date Time	Method Name	Type	Type Corr Sample Name							
03/12/2025 14:42:07	AI-01-M	Unknown								
Sample Name										
Meas.	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag
	%	%	%	%	%	%	%	%	%	%
1	0.0528	0.0815	1.73	0.0099	1.82	0.0075	0.00082	5.80	0.0368	0.00084
2	0.0525	0.0859	1.79	0.0100	1.87	0.0071	<0.00040	5.85	0.0381	0.00083
3	0.0471	0.0589	1.51	0.0104	1.74	0.0081	<0.00040	5.48	0.0581	0.00083
Meas.	B	Ba	Be	Bi	Ca	Cd	Ce	Co	Ga	Hg
	%	%	%	%	%	%	%	%	%	%
1	0.00097	<0.00010	0.00064	<0.00100	0.00049	0.0027	<0.0015	<0.00050	0.0052	0.0044
2	0.00078	<0.00010	0.00062	<0.00100	0.00015	0.0024	<0.0015	<0.00050	0.0050	0.0040
3	0.00075	<0.00010	0.00055	<0.00100	0.00048	0.0024	<0.0015	<0.00050	0.0049	0.0039
Meas.	In	La	Li	Mo	Na	P	Pb	Sb	Sn	Sr
	%	%	%	%	%	%	%	%	%	%
1	<0.00030	<0.00030	<0.00010	0.0064	0.00049	0.0026	0.0045	<0.0030	<0.00050	<0.00010
2	<0.00030	<0.00030	<0.00010	0.0062	0.0017	0.0018	0.0029	<0.0030	<0.00050	<0.00010
3	<0.00030	<0.00030	<0.00010	0.0066	0.00022	0.0025	0.0025	<0.0030	<0.00050	<0.00010
Meas.	V	Zr	Sc	Bg	Al					
	%	%	%		%					
1	0.0091	0.0970	<0.0500		90.3					
2	0.0088	0.0929	<0.0500		90.1					
3	0.0104	0.101	<0.0500		90.9					

GROUP D

Measure Date Time	Method Name	Type	Type Corr Sample Name
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04/12/2025 10:47:21 Fe-01-M Unknown

Sample Name	Operator	Grade Norm	Grade ID
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Meas.	C	Si	Mn	P	S	Cr	Mo	Ni	Al	Co
	%	%	%	%	%	%	%	%	%	%
1	0.421	0.258	1.05	0.0049	0.0150	0.156	0.0202	0.0659	0.0227	0.0067
2	0.411	0.254	1.05	0.0051	0.0159	0.157	0.0195	0.0650	0.0226	0.0071
3	0.423	0.260	1.06	0.0053	0.0155	0.157	0.0200	0.0653	0.0219	0.0069

Meas.	Cu	Ti	V	W	Sn	As	Bi	Ca	Ce	Sb
	%	%	%	%	%	%	%	%	%	%
1	0.0314	0.0199	0.0034	0.0194	0.0037	0.0098	0.0114	0.0019	0.0021	0.0073
2	0.0317	0.0207	0.0031	0.0174	0.0038	0.0107	0.0115	0.0016	0.0017	0.0072
3	0.0318	0.0204	0.0032	0.0190	0.0038	0.0096	0.0116	0.0023	0.0020	0.0082

Meas.	Te	Ta	B	Zn	N	Fe
	%	%	%	%	%	%
1	0.0013	0.0309	0.00037	0.0014	0.0277	97.8
2	0.0016	0.0367	0.00039	0.0015	0.0265	97.8
3	0.0015	0.0338	0.00037	0.0014	0.0186	97.8

Group E

Measure Date Time	Method Name	Type	Type Corr Sample Name
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04/12/2025 15:47:17 AI-01-M Unknown

Sample Name

Meas.	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Ti	Ag
	%	%	%	%	%	%	%	%	%	%
1	0.0530	0.162	1.98	0.0102	1.80	0.0083	0.0032	5.68	0.0172	0.0010
2	0.0561	0.0793	1.70	0.0092	1.84	0.0074	<0.00040	5.98	0.0481	0.00095
3	0.0572	0.0713	1.61	0.0095	1.80	0.0074	0.00043	5.93	0.0542	0.00099

Meas.	B	Ba	Be	Bi	Ca	Cd	Ce	Co	Ga	Hg
	%	%	%	%	%	%	%	%	%	%
1	0.0056	0.00026	0.00076	<0.00100	0.00096	0.0016	<0.0015	<0.00050	0.0055	0.0022
2	0.0016	<0.00010	0.00064	<0.00100	<0.00010	0.0019	<0.0015	<0.00050	0.0050	0.0019
3	0.0014	<0.00010	0.00066	<0.00100	<0.00010	0.0017	<0.0015	<0.00050	0.0053	0.0017

Meas.	In	La	Li	Mo	Na	P	Pb	Sb	Sn	Sr
	%	%	%	%	%	%	%	%	%	%
1	<0.00030	<0.00030	<0.00010	0.0077	0.0074	0.0099	0.0074	<0.0030	0.0012	<0.00010
2	<0.00030	<0.00030	<0.00010	0.0065	0.0064	0.0031	0.0040	<0.0030	<0.00050	<0.00010
3	<0.00030	<0.00030	<0.00010	0.0066	0.0015	0.0024	0.0045	<0.0030	<0.00050	<0.00010

Meas.	V	Zr	Sc	Bg	Al
	%	%	%		%
1	0.0093	0.101	<0.0500		90.1
2	0.0100	0.0980	<0.0500		90.1
3	0.0100	0.0959	<0.0500		90.3

Group F