

Soluble SiO₂

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Outline

- Background
- AOAC Reference Method
 - JOURNAL OF AOAC INTERNATIONAL VOL. 96, NO. 2, 2013 251
- Extraction Procedure- Solution of Sodium Carbonate-Ammonium Nitrate
 - Deviate from 5 day waiting to Within 1 day
 - Weigh sample and shake in Extraction Solution 60 mins
- Analysis/Detection
 - Visible Spectroscopy- dilute extract, add reagents
 - Wait (1 hour) to develop color (blue to purple).
 - Measure Absorbance at 660 nm- small linear range 2ppm- blue to purple
 - ICP-OES- analyzed at 251 nm- long linear range- up to 20% Si
- Comparison of both Labs and two detections

	MV Result 1	10.05.2018	MV Result 2	10.12.2018	MV Result 3	10.18.2018	MV Result 4	1 - Day Extracted		1 - Day extracted	5 - Day Extracted	
Guaratee % SiO2	Visible Spect. 660 nm	ICP Axial 251nm	Visible Spect. 660 nm	ICP Axial 251nm	Visible Spect. 660 nm	ICP Axial 251nm	ICP Axial 251 nm	Rep -1 (% SiO2)	Rep -2 (% SiO2)	Rep -1 (% SiO2)	Rep -1 (% SiO2)	Rep -2 (% SiO2)
8.0%	9.5	8.8	8.6	8.9	8.8	10.2	9.5	9.03	8.88	9.24	9.18	9.13
10.0%	9.1	9.3	8.6	9.9	9.3	11.6	10.4	9.90	9.09	10.03	9.93	9.24
8.0%	8.5	8.7	8.4	9.0	8.5	9.5	9.7	8.71	8.99	9.26	8.60	9.07
11.0%	6.9	7.8	6.3	7.8	7.0	8.1	9.6	7.74	8.07	7.92	7.92	8.79
0.15%	0.5	0.5	0.7	0.7	0.7	0.69	0.70	0.71	0.88	0.62	0.81	0.77
0.15%	0.5	0.8	0.3	0.8	0.5	0.82	0.50	0.71	0.73	0.47	0.86	0.90
7.8%	7.0	6.7	6.4	7.3	6.9	8.0	8.2	7.55	7.70	7.55	7.57	7.87
7.5%	6.5	6.1	6.3	6.8	6.1	7.6	6.8	7.00	6.74	7.00	6.91	6.82
20.0%	15.2	18.5	13.7	19.6	11.0	20.7	19.7	18.16	18.16	20.34	15.83	15.42
11.2%	8.6	8.8	8.7	9.2	9.1	9.9	9.0	9.50	9.18	9.58	9.41	9.37
1.6%	1.1	1.1	1.0	1.3	1.1	1.2	1.1	1.43	1.37	1.33	1.24	1.39
7.3%	9.0	8.7	9.2	9.0	9.3	10.3	7.6	9.58	9.46	9.58	9.61	9.39

avg Vis avg ICP

9.0 9.3

9.0 10.2

8.4 9.1

6.7 7.9

0.6 0.6

0.4 0.8

6.8 7.3

6.3 6.8

13.3 19.6

8.8 9.3

1.1 1.2

9.2 9.3

t-Test: Two-Sample Assuming Equal Variances

	<i>Variable 1</i>	<i>Variable 2</i>
Mean	6.632672684	7.622516667
Variance	16.01824757	27.01667554
Observations	12	12
Pooled Variance	21.51746155	
Hypothesized Mean Difference	0	
df	22	
t Stat	-0.522693205	
P(T<=t) one-tail	0.303206089	
t Critical one-tail	1.717144374	
P(T<=t) two-tail	0.606412178	> 0.05 so NOT Significant
t Critical two-tail	2.073873068	

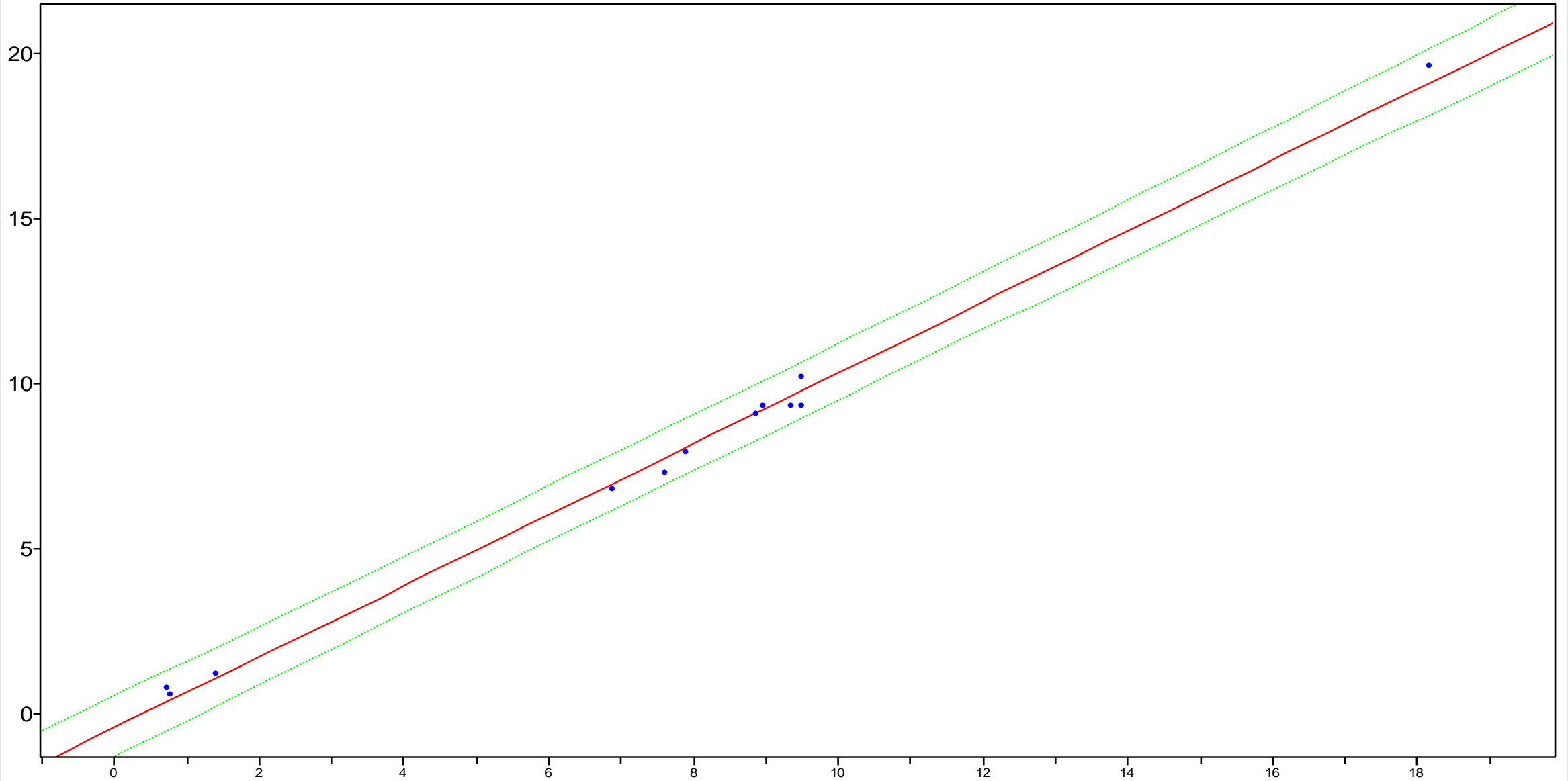
Column K NOT significantly different from column L
at 5% significance level

t-Test: Two-Sample Assuming Equal Variances

CA	Thornton
avg Vis	Avg Vis
9.0	9
9.0	9.7
8.4	9
6.7	7.9
0.6	0.7
0.4	0.6
6.8	7.6
6.3	6.9
13.3	18.9
8.8	9.4
1.1	1.4
9.2	9.5

	Variable 1	Variable 2
Mean	6.632673	7.55
Variance	16.01825	25.31545
Observations	12	12
Pooled Variance	20.66685	
Hypothesized Mean Difference	0	
df	22	
t Stat	-0.49427	
P(T<=t) one-tail	0.313008	
t Critical one-tail	1.717144	
P(T<=t) two-tail	0.626016	> 0.05 so NOT Significant
t Critical two-tail	2.073873	

ICP_CAC predicted by VISIBLE__THORTAN



Linear: $Y = -0.4096653 + 1.074236 * X$ R-squared = 0.9955823

Linear ———
95% C.I. - - - -

