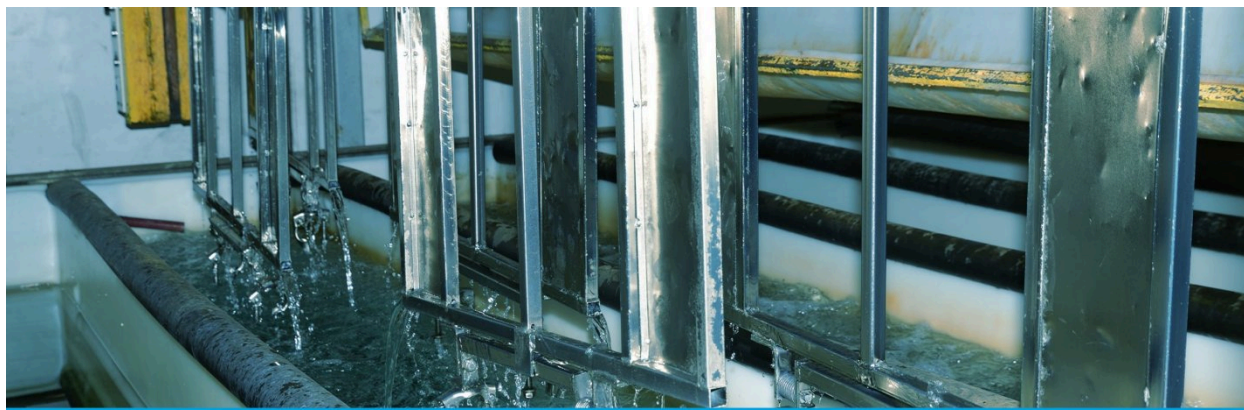


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EDXRF1990 - Plating Baths



Scope

The analysis of various plating baths is demonstrated for electroless and electroplating applications.

Background

Metal parts are often plated to create a decorative surface finish or to ensure desired physical properties, such as corrosion and salt resistance, lubricity, protection from wear and abrasion, and to improve the hardness of the plated metal. Electro-plating and electroless plating are commonly used in almost every industry, from aerospace and electronics to the gas and oil industry and general construction. Monitoring the bath composition is vital in quality control to ensure finished parts are plated to the correct thickness to achieve desired properties without over-coating and wasting chemical materials. Applied Rigaku Technologies offers [NEX QC](#) benchtop EDXRF analyzer for the measurement of plating bath composition in a small, easy to use tool, ideal for at-line quality checks or quality confirmation in the lab.

Units

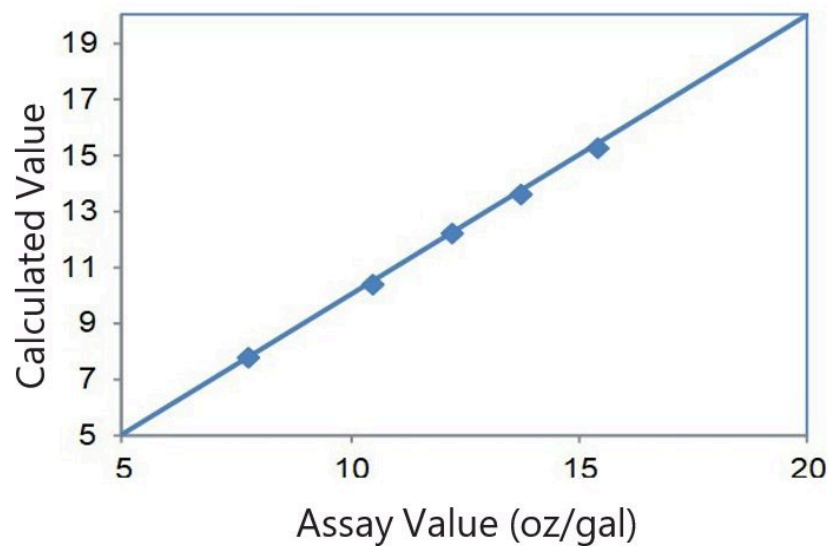
1 oz/gal = 7.489 g/L

1 g/L = 0.134 oz/gal

Ni Bath

Calibration

Element: Ni		
Units: oz/gal		
Sample I.D.	Assay value	Calculated value
1	7.773	7.788
2	10.498	10.373
3	12.250	12.213
4	13.719	13.592
5	15.395	15.236



Correlation plot Ni bath

Recovery and repeatability

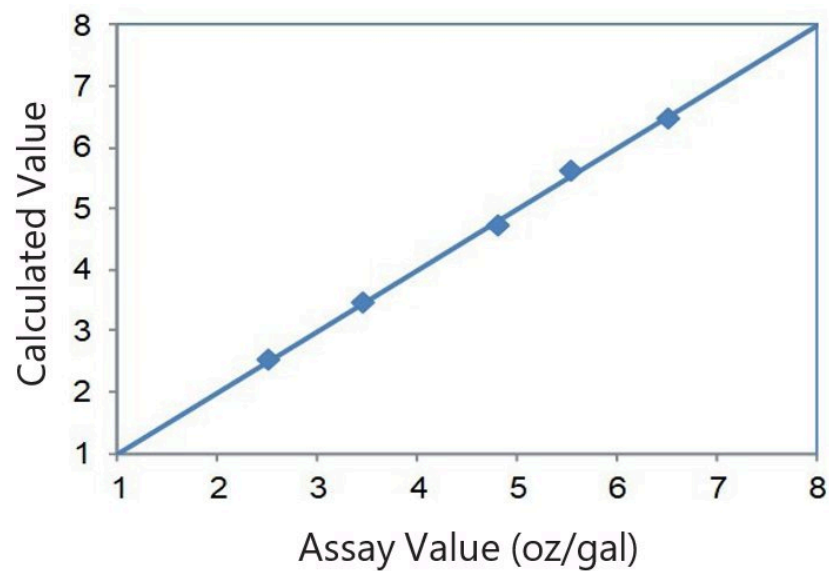
To demonstrate recovery and repeatability (precision), low and high calibration standards were analyzed in a static position for 10 consecutive measurements.

Sample ID	Units	Assay value	NEX QC avg. value	Standard deviation	RSD %
Std 1	oz/gal	7.773	7.742	0.037	0.5
Std 5	oz/gal	15.395	15.425	0.043	0.3

CuCN Bath

Calibration

Element: CuCN		
Units: oz/gal		
Sample I.D.	Assay value	Calculated value
1	2.500	2.518
2	3.457	3.464
3	4.800	4.710
4	5.545	5.627
5	6.500	6.483



Correlation plot CuCn bath

Recovery and repeatability

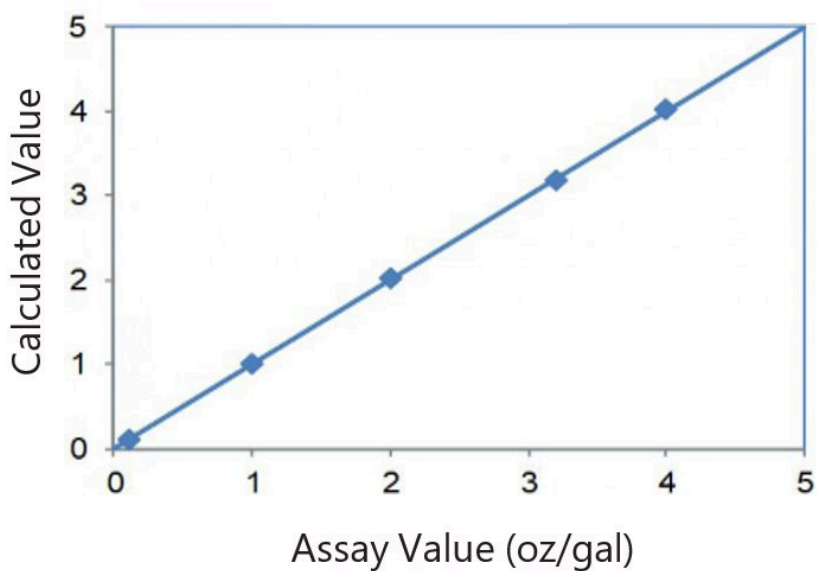
To demonstrate recovery and repeatability (precision), low and high calibration standards were analyzed in a static position for 10 consecutive measurements.

Sample ID	Units	Assay value	NEX QC avg. value	Standard deviation	RSD %
Std 1	oz/gal	2.500	2.530	0.010	0.4
Std 5	oz/gal	6.500	6.531	0.015	0.2

AgCN Bath

Calibration

Element: AgCN		
Units: oz/gal		
Sample I.D.	Assay value	Calculated value
1	0.100	0.099
2	1.000	1.000
3	2.000	2.011
4	3.200	3.179
5	4.000	4.011



Correlation plot AgCN bath

Recovery and repeatability

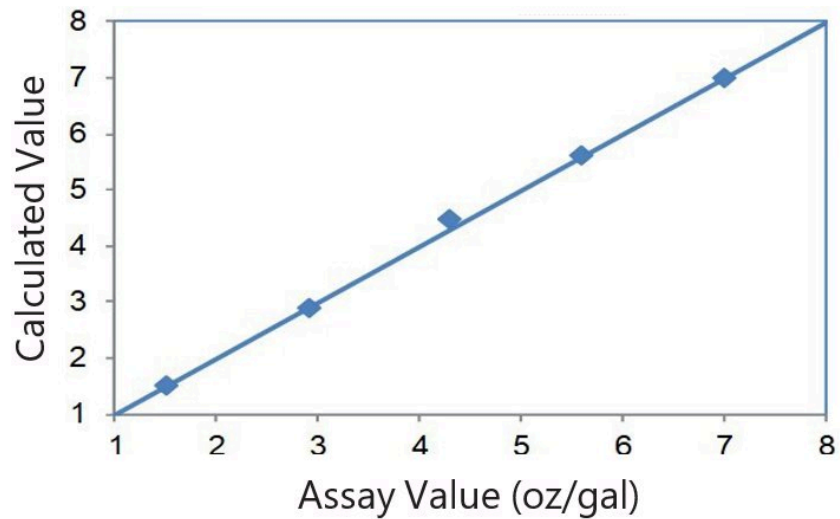
To demonstrate recovery and repeatability (precision), low and high calibration standards were analyzed in a static position for 10 consecutive measurements.

Sample ID	Units	Assay value	NEX QC avg. value	Standard deviation	RSD %
Std 1	oz/gal	0.100	0.100	0.0004	0.4
Std 5	oz/gal	4.000	4.036	0.008	0.2

CdCN Bath

Calibration

Element: CdCN		
Units: oz/gal		
Sample I.D.	Assay value	Calculated value
1	1.500	1.500
2	2.905	2.911
3	4.300	4.469
4	5.597	5.636
5	7.000	6.986



Calibration plot CdCN bath

Recovery and repeatability

To demonstrate recovery and repeatability (precision), low and high calibration standards were analyzed in a static position for 10 consecutive measurements.

Sample ID	Units	Assay value	NEX QC avg. value	Standard deviation	RSD %
Std 1	oz/gal	1.500	1.500	0.005	0.3
Std 5	oz/gal	7.000	6.997	0.033	0.5

Conclusion

The results indicate NEX QC system yields exceptional performance for the analysis of plating baths. The rugged self-contained system with simple, intuitive software makes the NEX QC analyzer an ideal tool for at-line quality control or in the QC lab itself. This methodology can also be adapted for in-line process control in real time with the Rigaku NEX OL process analyzer.

Related products



NEX QC Series

Combines quality, affordability, and performance for a wide range of applications