Application Note XRT1337

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XRT1337 - Cu Wood Treatment

Scope

This application note demonstrates the measurement of copper (Cu) in wood treatment solution using NEX OL.

Background

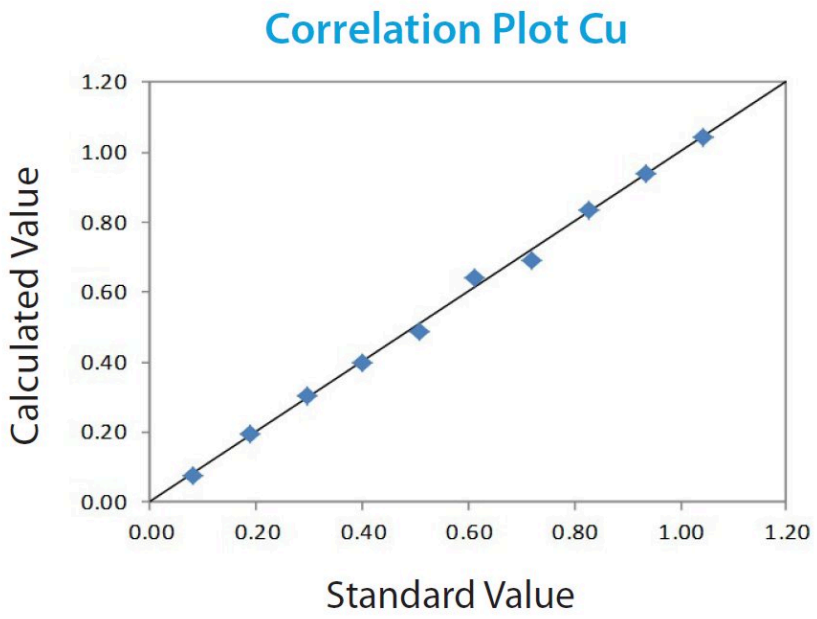
Wood treatments are used to protect lumber from fungi, insects, UV damage, and general wear. Lumber treated with copper or copper oxide is used in a variety of residential and commercial construction projects, including house and building foundations, fences, patio decks, and playground playscapes. When treating wood, the proper balance of treatment solution must be monitored to ensure the highest quality while minimizing waste and excess cost due to treatment usage or product rejection. Cu or CuO levels are monitored in solution prior to treatment, and then in the wood to ensure proper retention. A quick, simple, reliable means of analysis is required throughout the quality control process. XRF is an ideal tool for such analysis.

Calibration

An empirical calibration was built using a set of assayed solution standards.

Element: Cu Units: %		
Sample ID	**Assay value**	**Calculated value**
1	0.080	0.076
2	0.187	0.196

3	0.294	0.303
4	0.400	0.396
5	0.507	0.489
6	0.613	0.604
7	0.720	0.692
8	0.827	0.832
9	0.934	0.938
10	1.041	1.041



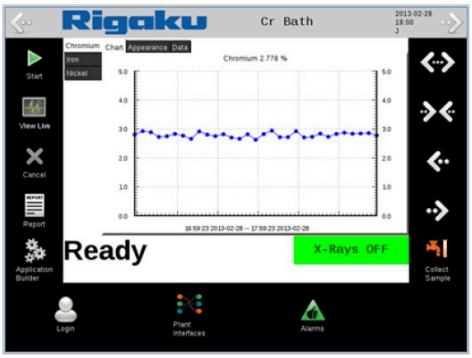
Repeatability – Cu in Solution

To demonstrate repeatability (precision), the low and high samples were chosen from the set of calibration standards. Each sample was measured in static position for ten repeat analyses.

Element: Cu Units: %

Sample I.D.	Standard value	Average value	Std. dev	% Relative
1	0.080	0.0815	0.0008	1.0
10	1.041	1.0431	0.0024	0.2

NEX OL features and benefits



- Real-time process control
- Trend analysis charting
- Capable of measuring elements Al to U, depending on application
- Robust Rigaku NEX QC+ optical kernel with SDD detector
- Industrial touchscreen user interface
- Unique toolless flow cell design
- No dangerous radioisotopes

Conclusion

The NEX OL offers real time trend analysis in a simple yet powerful and versatile system for quantifying the elemental composition of a
process stream. The results of this study indicate that given stable samples, proper sample handling and proper calibration technique, the Rigaku NEX OL EDXRF can achieve excellent results in monitoring the concentration of copper in wood treatment and other solutions.

On-line and at-line

On-line systems are often used for trend analysis in conjunction with a benchtop analyzer for at-line analysis and periodic validation of on-line results. Rigaku offers both systems for optimum process and quality control.

Related products

NEX OL

On-line, multi-element process analyzer for liquid stream ap
plications