Application Note EDXRF1141

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EDXRF1141 - CuO Wood Treatment

Scope

This application note demonstrates the measurement of CuO in treated wood and wood treatment solutions using NEX Q C.

Background

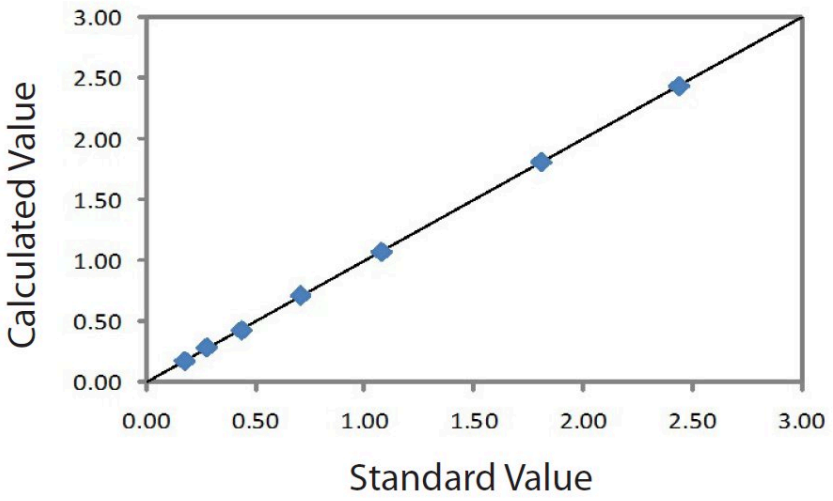
Wood treatments are used to protect lumber from fungi, insects, UV damage, and general wear. Lumber treated with copper or copper oxide is used in a variety of residential and commercial construction projects, including house and building foundations, fences, patio decks, and playground playscapes. When 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, and reliable means of analysis is required throughout the quality control process. XRF is an ideal tool for such analysis.

Calibration – CuO in wood

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

Element: CuO **Units: %**		
Sample I.D.	**Standard value**	**Calculated value**
W-A	0.18	0.178

W-B	0.28	0.288
W-C	0.44	0.430
W-D	0.71	0.717
W-E	1.08	1.074
W-F	1.81	1.814
W-G	2.44	2.438



Correlation plot CuO in wood

Repeatability – CuO in wood

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

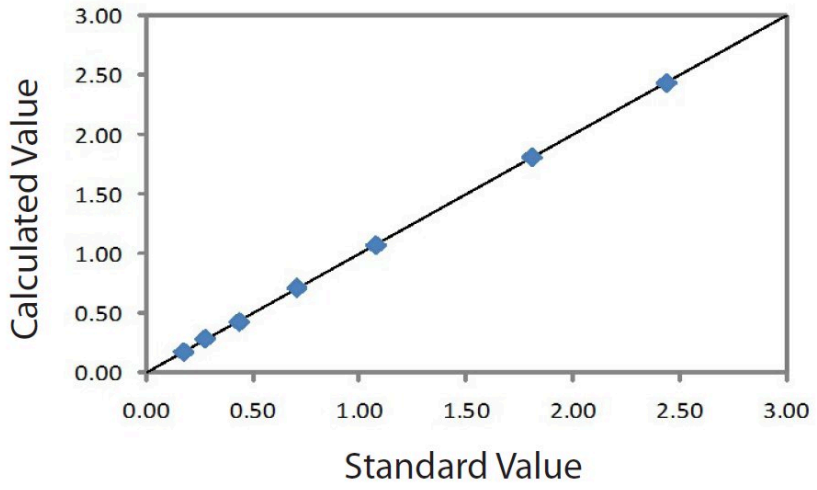
Element: CuO **Units: %**				
Sample I.D.	**Standard value**	**Average value**	**Std. dev**	**% Relative**
W-A	0.18	0.1754	0.0006	0.3
W-G	2.44	2.4380	0.0076	0.5

Calibration – CuO in solution

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

Element: CuO **Units: %**

Sample I.D.	Assay Value	Calculated Value
S-A	0.205	0.200
S-B	0.300	0.303
S-C	0.603	0.608
S-D	0.910	0.908
S-E	1.302	1.303
S-F	1.810	1.806
S-G	2.495	2.497



Correlation plot CuO in solution

Repeatability – CuO 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.

Element: CuO **Units: %**				
Sample I.D.	**Standard value**	**Average value**	**Std. dev**	**% Relative**
S-A	0.205	0.2012	0.0009	0.4
S-G	2.495	2.5074	0.0054	0.4

Conclusion

The typical results detailed here show exceptional performance for the fast and simple measurement of CuO in wood and solution. The Rigaku NEX QC is an excellent tool along the QC process in producing treated lumber, giving the production process an affordable means of optimizing quality while minimizing costs, and helping to minimize product rejection and waste.

Related products

NEX QC Series

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