

NANO3D provides an array of analytical service for chemical analysis. Any of these services can be used to assist in method development, quality control, or general analytical testing.

Chemical Analysis Techniques:

- **UV-VIS Spectroscopy**

UV-vis for determination of metals in the solutions.

- **Titration**

Titration for determination of buffers and reducing agents in the solutions.

- **FT-IR**

FT-IR for determination of wetting agents, surfactants and plating additives in the solutions.

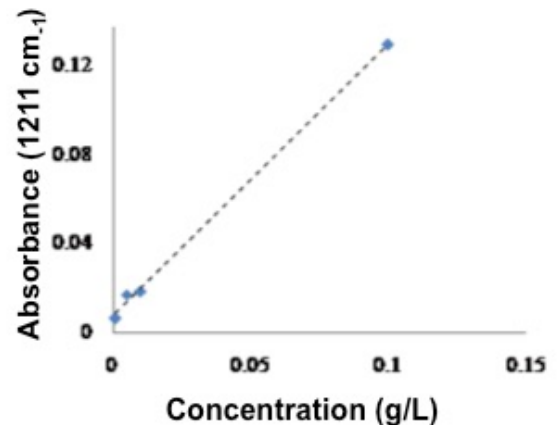
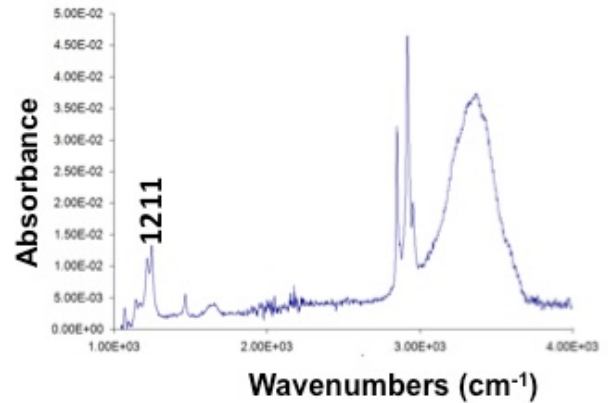
- **Voltammetry/CVS**

Voltammetry & CVS for analysis of plating additives.

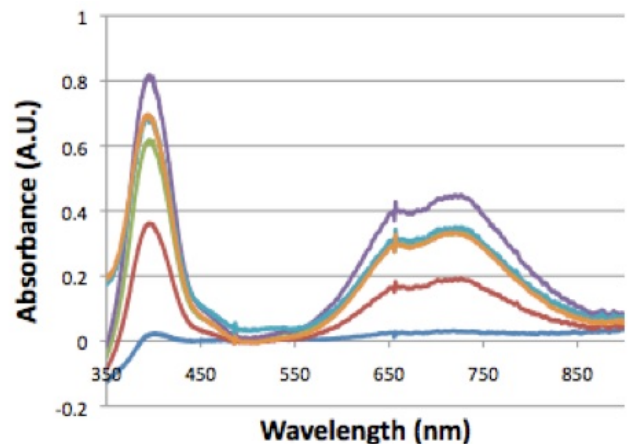
- **IC/HPLC**

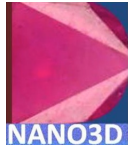
IC/HPLC for analysis of additives in plating baths, including accelerators, suppressors and levelers et al.

Right: UV-vis analysis of electroplating solution standards (blue, red, green, & purple)



Above: FT-IR spectra and standard curve for the wetting agent in an electroplating solution.





UV-VIS method development:

- **Optimize parameters**
 - Optimize dilution
 - Determine reference based on components
 - Create standard curve (LCL, target, UCL)
- **Perform statistical analysis**
- **Analyze unknown & active solutions**

Titration method development:

- **Determine the type of titration that is needed for component**
 - Acid-Base
 - Redox
 - Precipitation
 - Complexometric
- **Solution preparation and analysis**
 - Prepare Titrant, indicator, and any additives
 - Statistical analysis for known solutions
 - Determine amount of each component in unknown solutions or active plating baths

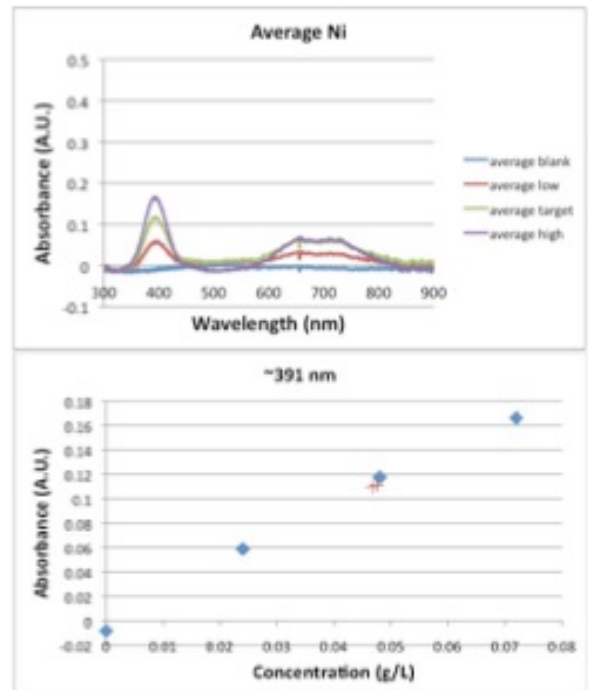
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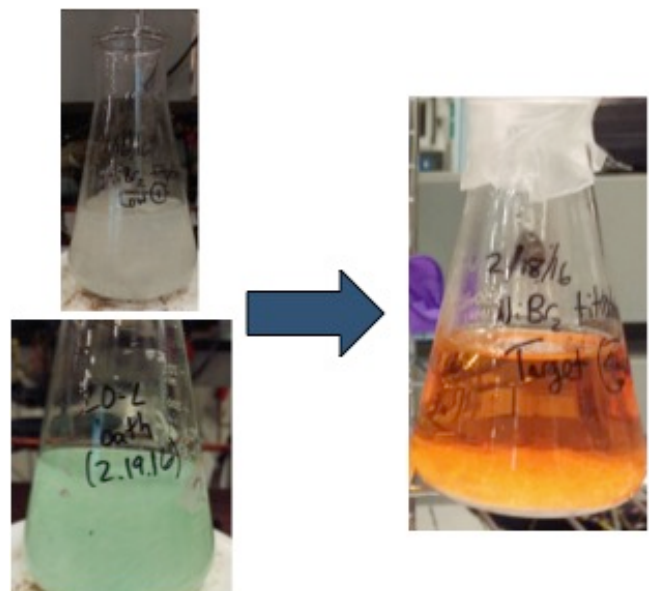
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Blank, LCL, Target, UCL spectra for Ni plating solution (top) and standard curve with experimental data (bottom)



Titration for NiBr in standard (top left) and Ni plating solution (bottom left).