

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.

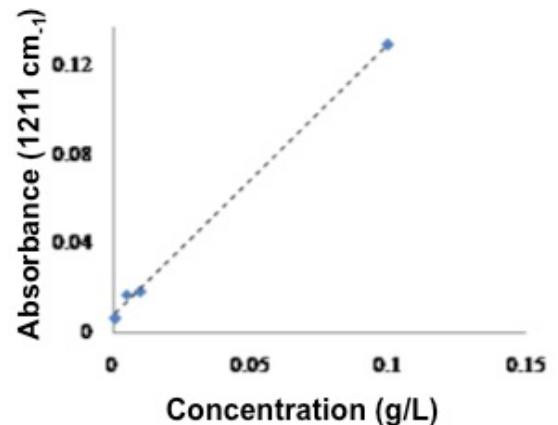
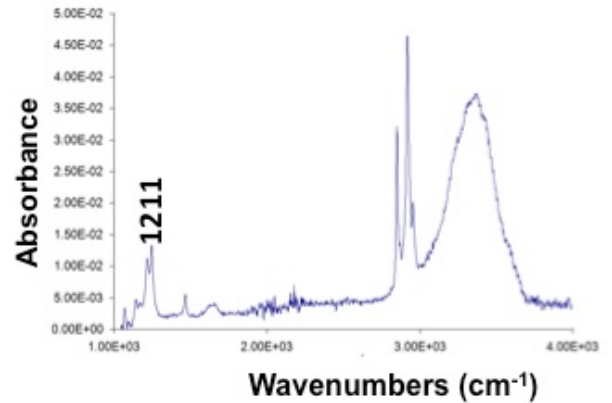
- **Voltammetry/CVS**

Voltammetry & CVS for analysis of plating additives.

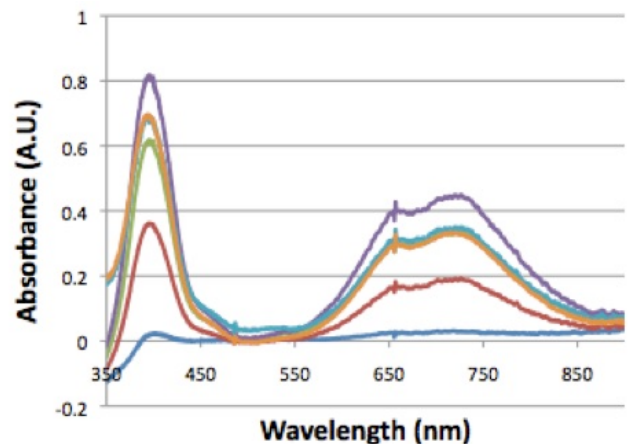
- **IC/HPLC**

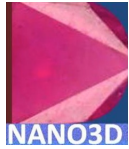
IC/HPLC for analysis of additives in plating baths, including accelerators, suppressors and levelers et al.

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

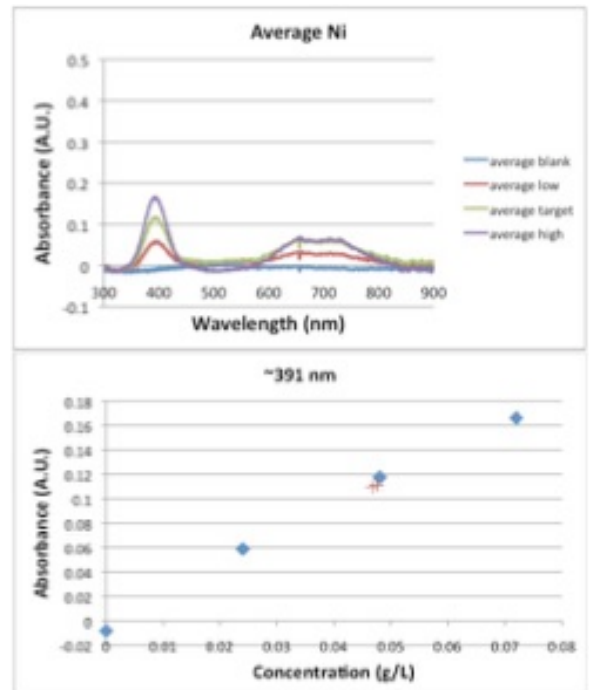
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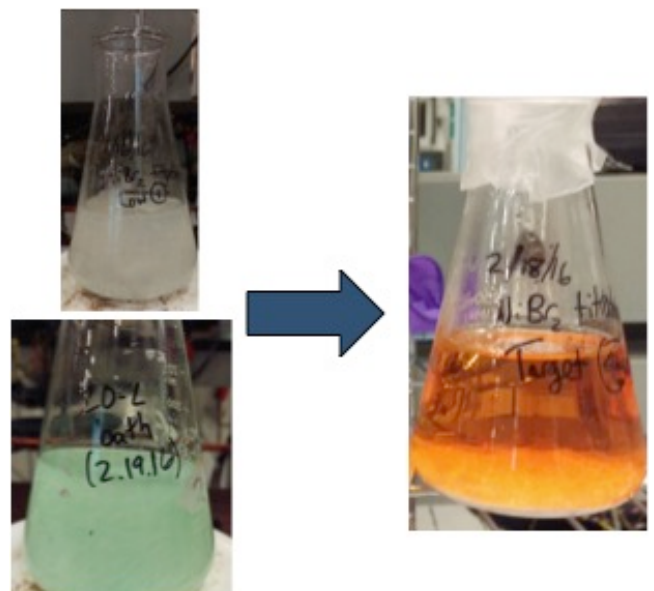
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Blank, LCL, Target, UCL spectra for Ni plating solution (top) and standard curve with experimental data (bottom)



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