



**Ameen Consulting**  
**Mentor, Ohio**

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John,

I have just recently stepped out of a 41 year career in the chemistry for the printed circuit industry and into an early retirement. One main instrument that was used extensively in our lab was the Vreeland Spectroscope.

Early on in my profession, I purchased a Vreeland spectroscope for my process-engineering lab. My group was servicing the very fast paced electronics industry. I was attracted to the Vreeland because it was ruggedly built, simple and ease of use. My group at the time included high school graduates through master degreed chemists. I needed something that my whole group could operate and be reasonably sure of the results. The Vreeland met those needs.

Many times unknowns from particles on a pwb, dirt in a plating bath, and even dissolved solids in acid pre-treat baths were easily identified with this instrument. One specific instance had to do with a nitric acid passivating bath. The nitric was to put an oxide film on an aluminum foil prior to copper plating. One day the copper plating was not being deposited properly. A couple of drops of the nitric bath were evaporated on the provided silicon powder inside the Vreeland. When the sample was raised into the arc, a chromium line appeared in the spectrum. Apparently the nitric acid was contaminated. The nitric bath was changed out and immediately the product quality returned. This was just one of the numerous applications that the Vreeland was used for.

In retirement, I am teaching a General Chemistry class for students who never had chemistry at a local community college. The college happened to have a Vreeland . I used it in one lab and found that my students had no trouble in learning the instrument and identifying unknowns. The students were not intimidated by the instrument and actually enjoyed using it. This is testimony to the rugged and intuitive design of this instrument.

Tom Ameen  
Retired and private consultant