

# Vreeland Spectroscope

Normally prospectors are totally reliant upon laboratory analysis to determine what a rock contains.

Obviously, the more a prospector knows the better and is less reliant upon others. However, because no one knows everything and the Earth is full of surprises it behooves a prospector to be as equipped with as many tools of the trade as possible.

Today, gizmos with flashing lights, dozens of levers/knobs and impressive gauges connected with bewildering battery of wires to high tech computer software that makes strange noises is the trend. Although these modern widgets are exciting, one must keep in mind that all instruments have pluses and minuses. Therefore, because of the old cliché – garbage in garbage out – I am skeptical of instruments utilizing computer software that only PhD's can comprehend.

In the quest of identifying unknowns I believe that the below instrument cannot be beat for its mechanical simplicity and cost effective semi-qualitative/quantitative analysis. Although it was late in the game before I was fortunate enough to get my hands on this wonderful tool, it was nevertheless better late than never. Not only have I been able to make discoveries, reduce my dependence upon labs, but also be able to verify my wet & dry assays.

As a result of being blessed with this tool and in the interest of saving the prospector a ton of money and irretrievable quantities of time I wholeheartedly advise those who seek minerals to purchase a magnificent Vreeland spectroscope as soon as possible.



Learning how to use this instrument is quick and easy.

Plug it in to any 110V wall socket. There are two buttons regulating high/low burn temperature. One knob adjusts electrodes and one knob raises and lowers the sample into the arc of electrodes. Two knobs adjust the films to distinguish the elements and a moveable up-down lens to view the generated visible light spectrum associated with the film.



The Vreeland equipped with a Cannon 12mp digital camera to record either single images or video clips of the generated spectrum lines as the mineral sample is melted and/or volatilized. With the camera I have what I consider to be a decent spectrograph and the saved images allow me to review the results.

## Operating the Vreeland



I am adjusting the film to a specific element number. The numbers can be seen in the small window just above the viewing lens.

Due to the need of adequate lighting for these pictures and not be exposed to the fumes I conduct these assays outside.





I am watching as I adjust the sample into the electric arc. There is a welder's type lens mounted on the vent hood that allows me to see the sample moving into the electric arc without damaging my eyes.



While the mineral sample is being melted and/or vaporized I am looking into the lens viewer to see what elements may be present. Since these images were taken I have purchased a long/large weather resistant outdoor table that allows me to have all the associated expendables, hand tools and note papers.

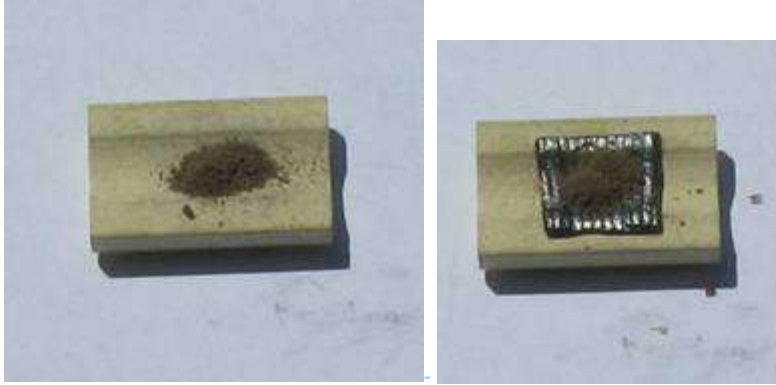
## Sample Preparation



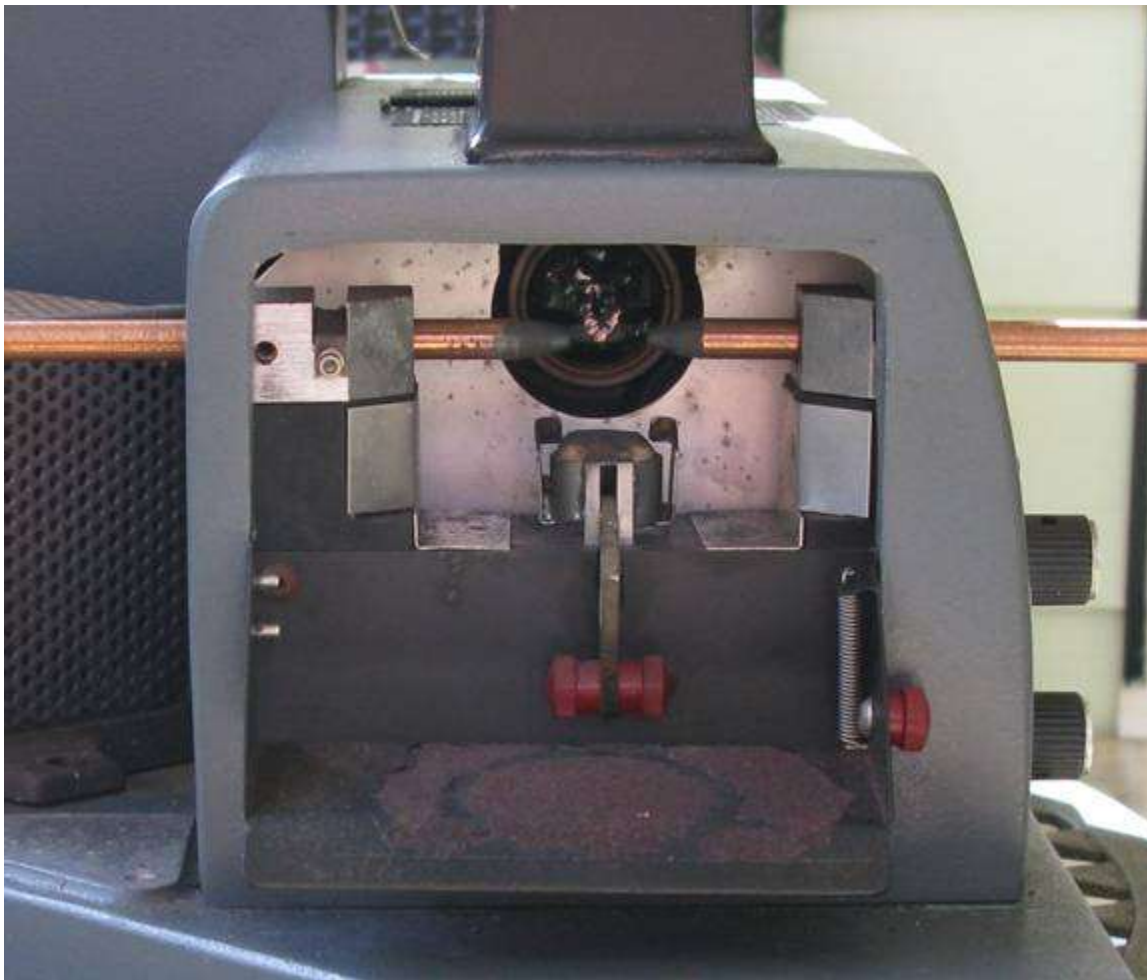
Before a test can be accomplished I use a ceramic mortar/pestle to pulverize the rock (at left).

A small amount of the pulverized sample is placed on a ceramic boat/crucible or on a graphite pad. The graphite pads are less expensive than the boats and usually allow me to make 2 to 4 burns of the same material with a single boat.

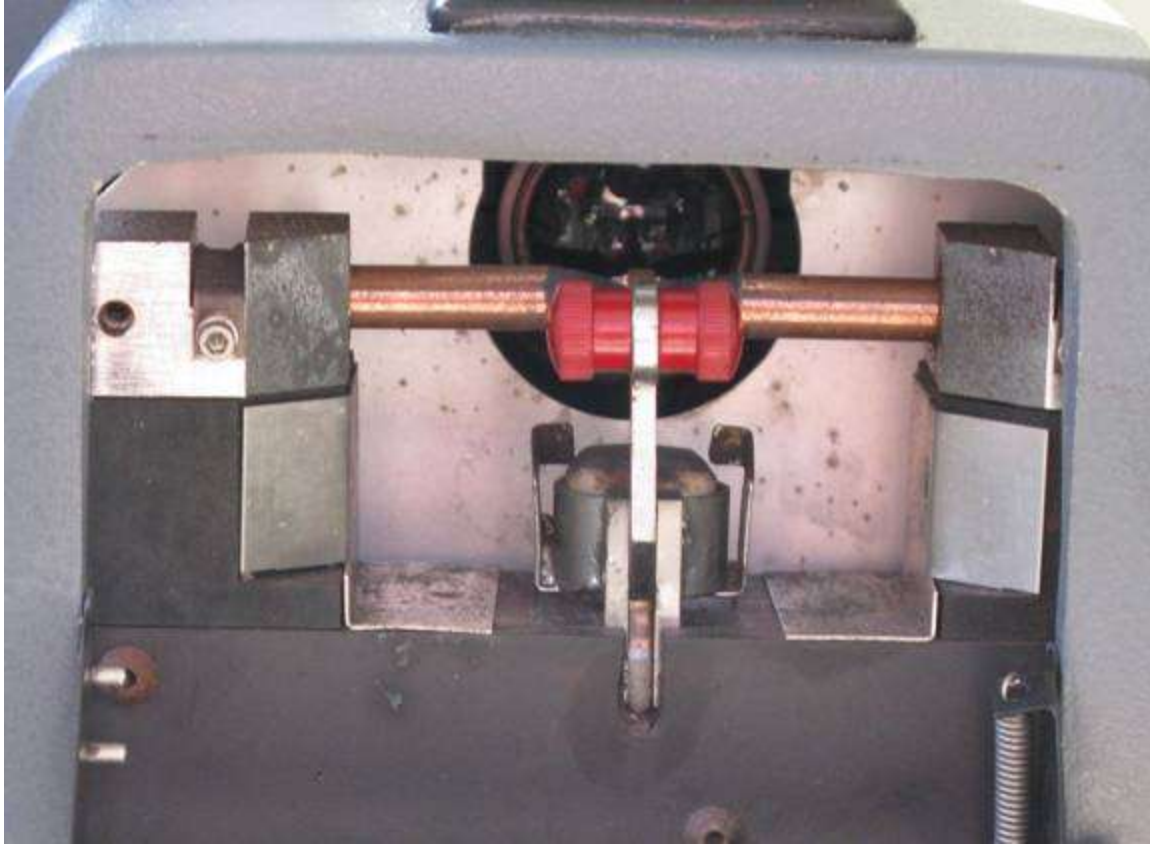




## The Burn

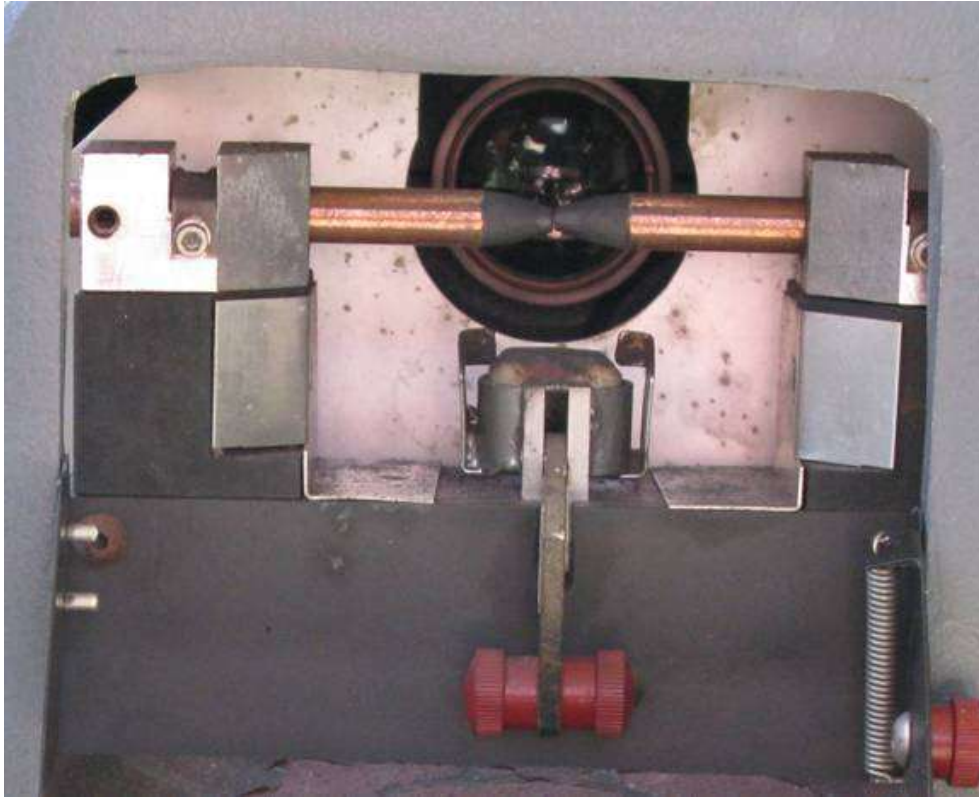


The copper coated carbon electrodes must be adjusted to a predetermined – centered - position prior to creating the arc. The red knobbed positional bracket is in the down (out of the way) position.

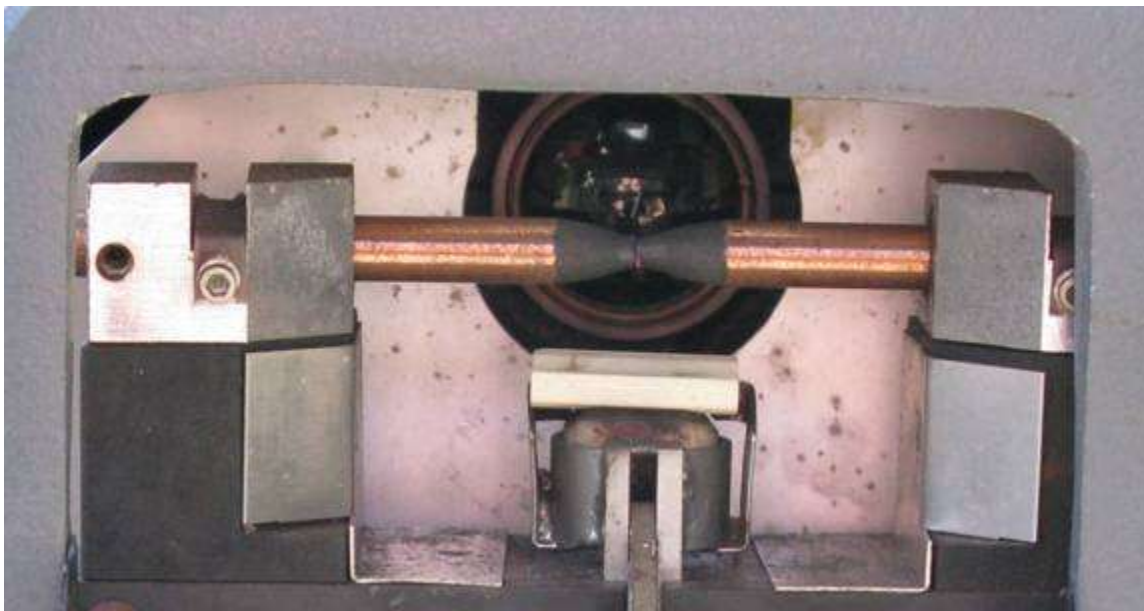


This image shows the red knobbed bracket in up position creating the exact centered position necessary for the arc light to sent through the lens behind the electrodes.  
The lens transmits the focused light to a slit then to the diffraction grating then to the viewer lens.





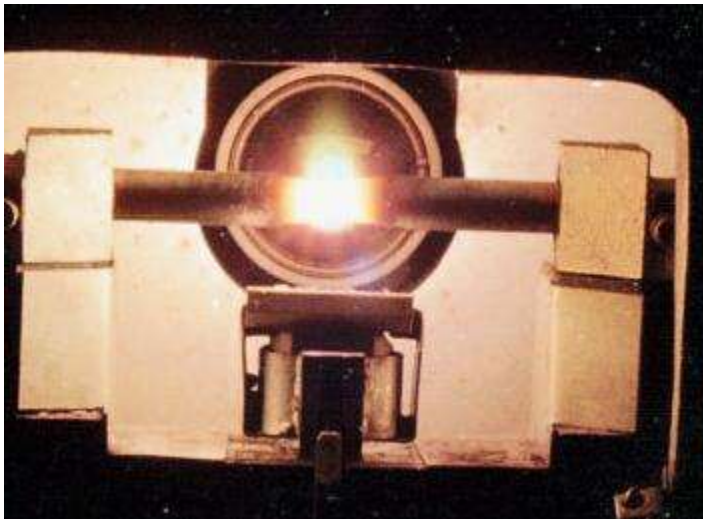
The electrodes are then adjusted to where they barely touch which when power is on an electric arc will be generated. The specs on the shield wall are due to flying hot/molten particles.



A ceramic boat containing the pulverized mineral sample is placed on the hearth in lowered position.



The boat is raised to about this position after the electric arc is generated.



The arc is initiated and the sample laden boat is slowly raised into the arc.



The sample is totally submerged in a bath of the hot (2000+F to 5000+F) electric arc.  
Fumes exit out the chimney.  
Normally, the electric arc cannot be seen because a flip door is closed.

[VIDEOS](#)