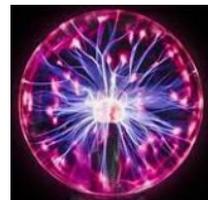


PLASMA BALL



SAFETY FIRST THEN TEAMWORK

Students and professional scientists alike work safely with heat, open flames, hazardous chemicals, sharp objects, and other possible hazards every day because they follow well-established lab safety rules. Work your way through the following checklist before beginning any lab.

- I am wearing appropriate clothing and PPE (personal protective equipment)
- I know how to use safely use the equipment of today's lab.
- I inspect all equipment for defects.
- I know the hazards of all substances I am working with today.

- ✓ If you can say yes to all checkmarks above You can now embark on your scientific adventure with confidence, knowing the prep work was done right.

CONSIDER THE FOLLOWING:

1. Does the plasma ball seem to work by the same properties as you know electricity to work? Why or Why NOT?

Vocabulary: define the following words 1st !!!!!

Voltage:

Resistance:

Current:

Electrical Filament:

Tesla Coil:

Partial Vacuum:

Inert Gasses (Group 18 Noble Gases):

Conductive Properties:

Discharge Path:

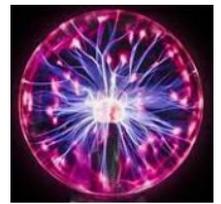
Humans as Conductors:

Atmospheric Air Content:

Investigate the following phenomena. record thorough data for each observation.

- ➔ Observe the plasma ball through the spectrometer. Write down the wavelength of all colors emitted.
 - Record in nanometers which are 1×10^{-9} meters in length.
- ➔ What happens when you bring a fluorescent bulb near the plasma ball?
- ➔ What happens when you bring an incandescent light bulb near the plasma ball?
- ➔ What happens when you hold the two electrodes of the Energy Stick?
- ➔ What happens when you bring the energy stick near the plasma ball?
- ➔ What happens when you touch the two electrodes of the Energy Balls?
- ➔ What happens when you put the energy balls near the plasma ball?

PLASMA BALL



Take this serious. The next two investigation pose a fire risk. These procedures must be done in the fume hood for safety. Coach Hyde should also be with you.

- Pyro #1
 - ✓ Turn OFF plasma ball.
 - ✓ Wrap plasma ball in aluminum foil.
 - ✓ Turn ON plasma ball
 - ✓ Hold a piece of paper against the aluminum foil.
 - ✓ Write with a metal object (paper clip)
 - ✓ Turn OFF plasma ball and remove aluminum foil. (check to see if its hot first)
- Pyro #2
 - ✓ Start with plasma ball OFF
 - ✓ Put a quarter or metallic object on plasma ball
 - ✓ put a small piece of paper on top, one slightly larger than the metal object
 - ✓ turn on plasma ball
 - ✓ now add a paper clip on top of paper
 - ✓ observer.
 - ✓ Turn off plasma ball and clean up.

Conclusion:

1. How does the plasma ball work?
2. Compare and contrast the filaments of an incandescent light bulb, fluorescent filaments and plasmas filaments? What are the similarities and differences in the methods used to produce light?
3. Why would inert gasses be used in the partial vacuum of the plasma ball's sphere?
4. For the pyro phenomena, why was the paper seared/burned?
5. Use the Spectral Analysis of the Noble Gases below, to Identify the gas or gasses used in the plasma ball.

