



Inquiry Approaches

Initial Inquiry

What are some types of light sources?

Some types of light sources are candles, the sun, fires, incandescent light bulbs, LED light bulbs, fluorescent light bulbs and gas-discharge lamps.

How do fluorescent light bulbs work?

A fluorescent light bulb contains mercury vapour and has an interior glass surface coated with a phosphor. When an electric current passes through the bulb, the mercury vapour becomes excited, causing it to emit short-wave ultraviolet radiation. This causes the phosphor to fluoresce, producing visible light.

Experimental Procedure Inquiry

How many particles are there in one mole?

There are 6.023×10^{23} particles in one mole.

What is the definition of molarity?

Molarity, also known as molar concentration, is the number of moles of solute per litre of solution.

How many moles of solute are there in 5 L of 3 M solution?

3 M means that there are 3 moles of solute per litre of solution. For 5 L of solution, there will be 15 moles.
 $3 \text{ mol/L} \times 5 \text{ L} = 15 \text{ mol}$.

In-Depth Inquiry

How can metals be characterized compared to other materials?

Metals can be distinguished from other materials by their appearance, malleability and ductility.

How can metals be distinguished from one another?

Different metals can be identified by their colour, density, appearance and results of the flame test.

Given a pure sample of an unknown element, what is one way to positively identify that element?

The element can be identified by emission spectroscopy. When excited, all elements emit a certain unique emission spectrum in the form of electron radiation of different wavelengths. By examining the radiation emitted by certain elements, they may be identified with a great degree of accuracy.

How else can metal ions be excited to cause the emission of light?

Metal ions can be excited by applying a source of direct heat, such as the flame in the traditional flame test.