

Light and Energy Worksheet

Data Tables and Observations

Data Table 1

Metal Solutions	Color/Observations
CaCl ₂	
CuCl ₂	
LiCl	
KCl	
NaCl	
SrCl ₂	
Unknown	

Data Table 2

Metal/Color of Flame	λ (nm)	λ (m)	ΔE (J)

Energy/Wavelength Calculations

Use Table 1 in the *Background* section to determine the approximate wavelength of light emitted for each metal. Record your wavelength in nanometers and meters in Data Table 2.

- Calculate the change in energy, ΔE , for each metal. Show all work. Record the values in joules in Data Table 2.
- Predict the color of the flame if the following materials were heated in the flame. Explain your predictions.
 - Copper(II) nitrate
 - Sodium sulfate
 - Potassium nitrate

Extension Question

- Write the electron configurations for the metals used and their corresponding ions.

Beaker	Indicator	Basic Color (Before)	Acidic Color (After)	pH	Range
1	Bromcresol	green	Blue	Yellow-green	5.4 to 3.8
2	Universal	indicator	Purple	Orange	10 to 4
3	Phenol	red	Red	Yellow	8.4 to 6.8
4	Methyl	red	Yellow	Red	6.2 to 4.4
5	Bromthymol	blue	Blue	Yellow	7.6 to 6.0