# Atomic Absorption Analysis for Copper

The following table provides some information about possible atomic absorption lines for copper. The column labeled "slit" is the recommended slit width for this line expressed as the effective bandwidth. When the monochromator is set at 327.4 nm, for example, radiation between 326.9 nm and 327.9 nm exits the monochromator. The column labeled "sensitivity" gives the concentration of Cu (in ppm) producing an absorbance of 0.2. The column labeled "intensity" gives the relative power from the hollow cathode lamp as a percentage of the most intense emission line.

| wavelength (nm) | slit | sensitivity | intensity |
|---|---|---|---|
| 217.9 | 0.2 | 15 | 3 |
| 218.2 | 0.2 | 15 | 3 |
| 222.6 | 0.2 | 60 | 5 |
| 244.2 | 0.2 | 400 | 15 |
| 249.2 | 0.5 | 200 | 24 |
| 324.8 | 0.5 | 1.5 | 100 |
| 327.4 | 0.5 | 3 | 87 |

Given what you know about atomic absorption linewidths you might reasonably expect that all emission lines would use the same large slit width. Explain why this might be a reasonable expectation and then speculate on why different emission lines actually require different slit widths.

The preferred wavelength for the analysis of Cu is 324.8 nm. Why do you think this is the optimum choice?

Suppose you decide to use the wavelength of 249.2 nm to analyze a sample of 1 ppm Cu. How will this affect the analysis relative to the preferred wavelength of 324.8 nm?

Can you think of a circumstance where a wavelength of 249.2 nm might provide a better choice for the analysis of Cu? Explain.