

AP WORKSHEET 03M: ANSWERS

- (a) When performing a Beer-Lambert law it is necessary to use a wavelength in the colorimeter that produces a high absorbance in the solution under test. Green solutions reflect green light, and absorb light on the opposite side of the color wheel (the complementary color). In this case, red is chosen since it is the complementary color of green and produces a high absorbance in the nickel(II) solution.
- (b) They are inversely proportional. As absorbance goes up, transmittance goes down.
- (c) If $A = 0$, then $T = 1$. With transmittance = 1, it suggests that 100% of the light passes through the sample, i.e., absorbance is zero.
- (d) Approx. 0.78 mol L^{-1} (read from the graph).
- (e) Aqueous magnesium chloride is a colorless solution, and as such the absorbance and transmittance of light does not vary with concentration. That makes it unsuitable for analysis in such a Beer-Lambert experiment that uses a colorimeter. Transition metals often form colored salts that can be analyzed in this manner.



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