

Competition Corner: Spectral Evidence

g11_u06_w22

Original fictional paper-model challenges. Use $A = 0.400C + 0.020$; no apparatus or identification procedure is implied.

Challenge 21. Three fictional calibration cards are $C = 0.00, 1.00, 2.00 \text{ mg L}^{-1}$ with observed $A = 0.018, 0.425, 0.810$. Calculate each residual from the stated model. Which is largest in magnitude? What limitation remains even if all residuals are small?

Challenge 22. Two fictional unknowns have $A = 0.470$ and 0.550 , with features at $510/650 \text{ nm}$ and $512/648 \text{ nm}$ respectively. Calculate each model concentration and their mean. State why the feature comparison may support a question for further study but cannot establish that the two unknowns are the same substance.