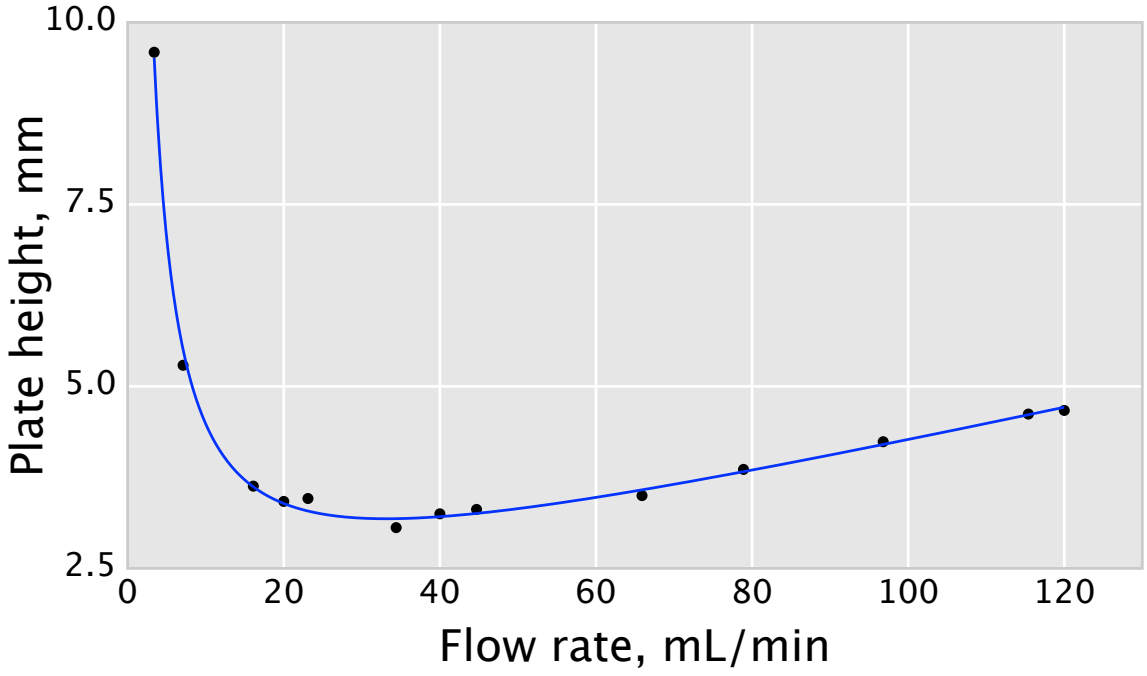
Use the van Deemter equation to choose the mobile phase flow rate to optimize efficiency of a chromatographic separation. Also calculate the standard error of that flow rate.



- Plate height, h, is a measure of chromatographic separation efficiency
- Van Deemter equation gives height, h, as a function of flow rate, u

$$h = A + \frac{B}{u} + Cu$$

$$u_{\text{opt}} = \sqrt{\frac{B}{C}}$$

- Errors in regression parameter estimates are almost always correlated, meaning that we must account for that when propagating the error of the B and C estimates to u_{opt}

Linear vs Nonlinear Regression

The van Deemter equation is a nonlinear function, so how is it considered a linear regression model? And why is that important?

- Even though this is a curved function, ***it is a linear regression model*** because it is linear *with respect to the regression parameters*.

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- It is important because we can LS estimates and their std errors directly, without using an iterative procedure (eg using SOLVER)