Entering data

$startVol := 20mL$

$StockConc := 20\frac{gm}{L}$ Estimated from spretsheet

$$FlowTime := \begin{pmatrix} 171.3 \\ 180.1 \\ 189.1 \\ 196.1 \\ 205.9 \\ 214.9 \\ 221.8 \end{pmatrix} \cdot sec \qquad add := \begin{pmatrix} 0 \\ 0.5 \\ 0.5 \\ .5 \\ .5 \\ .5 \\ .5 \end{pmatrix} mL$$

Entering contsants

DMF 25C from Lutinger, G.; Weill, G.; *Polymer*, **1991**, *32*, 877

$k := 4.5 \cdot 10^{-2} \quad \frac{mL}{gm}$

$a := 0.7$

Calculating concentrations

$i := 0 .. rows(add) - 1$

$conc_i := \frac{StockConc \cdot i \cdot 0.5mL}{startVol + i \cdot 0.5mL}$

$$conc = \begin{pmatrix} 0 \\ 4.878 \times 10^{-4} \\ 9.524 \times 10^{-4} \\ 1.395 \times 10^{-3} \\ 1.818 \times 10^{-3} \\ 2.222 \times 10^{-3} \\ 2.609 \times 10^{-3} \end{pmatrix} \frac{gm}{mL}$$

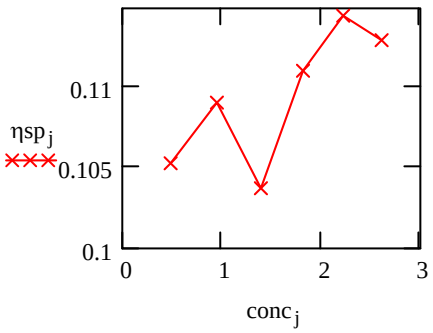
Calculating the specefic viscusity

$$\eta sp_i := \frac{FlowTime_i - FlowTime_0}{FlowTime_0 \cdot conc_i}$$

$$\eta sp = \begin{pmatrix} 0 \\ 105.312 \\ 109.107 \\ 103.756 \\ 111.092 \\ 114.536 \\ 113.008 \end{pmatrix} \frac{mL}{gm}$$

Making a plot for visualization

$$j := 1 .. rows(add) - 1$$



Eliminating the first point (solvent only) and units

$$conc1_{j-1} := conc_j \cdot \frac{mL}{gm}$$

$$\eta sp1_{j-1} := \eta sp_j \cdot \frac{gm}{mL}$$

$$\eta sp = \begin{pmatrix} 0 \\ 0.105 \\ 0.109 \\ 0.104 \\ 0.111 \\ 0.115 \\ 0.113 \end{pmatrix} \frac{m^3}{kg}$$

Calculating best fit line on the data

$$coor := line(conc1, \eta sp1)$$

$$coor = \begin{pmatrix} 102.889 \\ 4.162 \times 10^3 \end{pmatrix}$$

$$MolWeigth := 10^{\left(\frac{\log(coor_0) - \log(k)}{a}\right)} \frac{gm}{mol}$$

$$MolWeigth = 6.292 \times 10^4 \frac{gm}{mol}$$