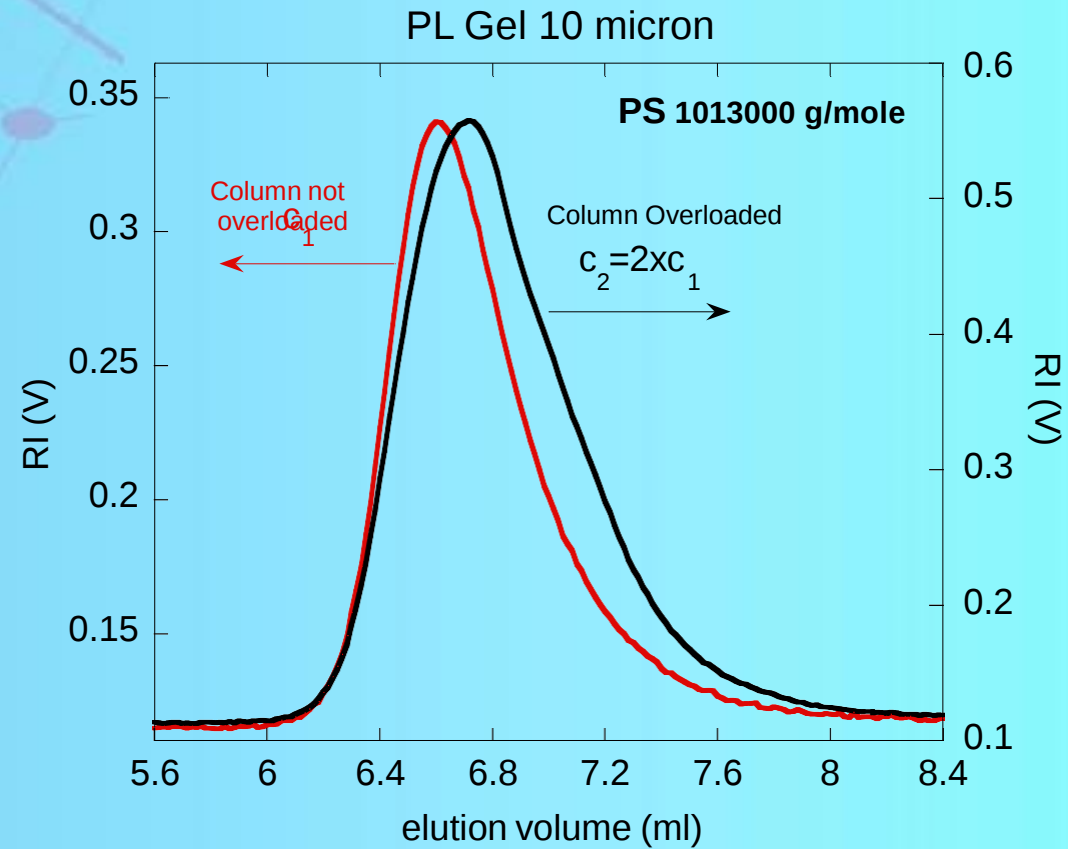




Sources of error in GPC

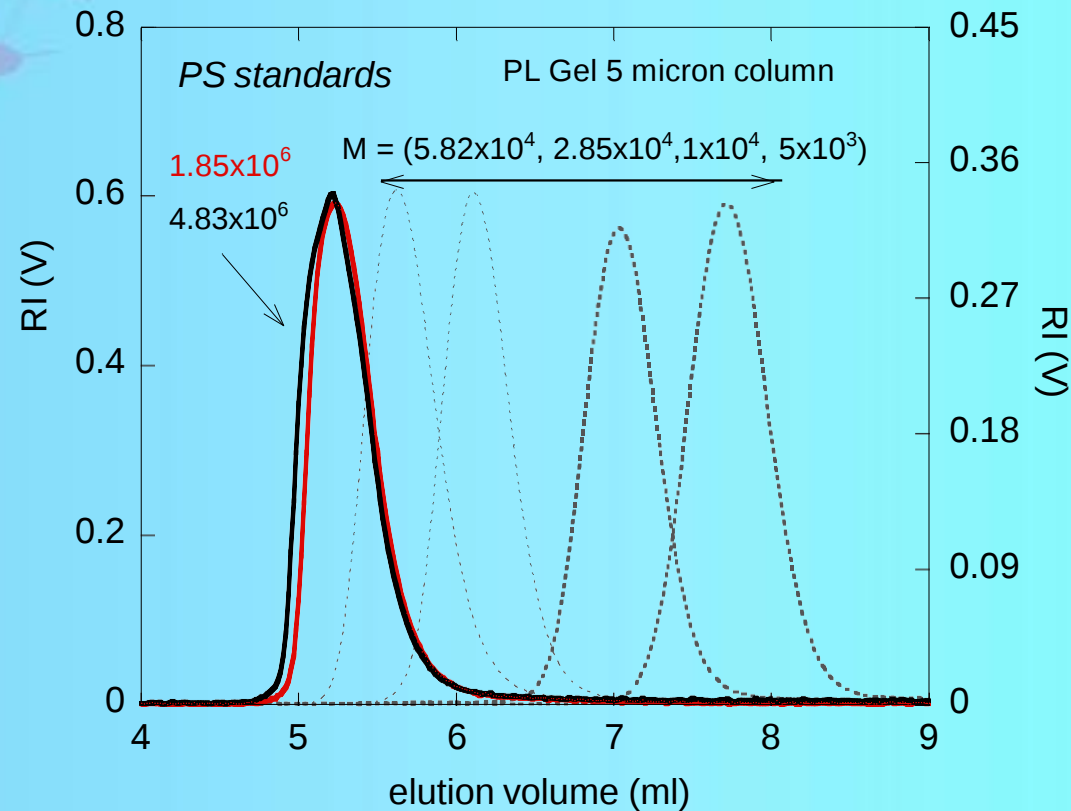
Sources of error due to GPC columns

Effects of column overload; peak shift and broadening



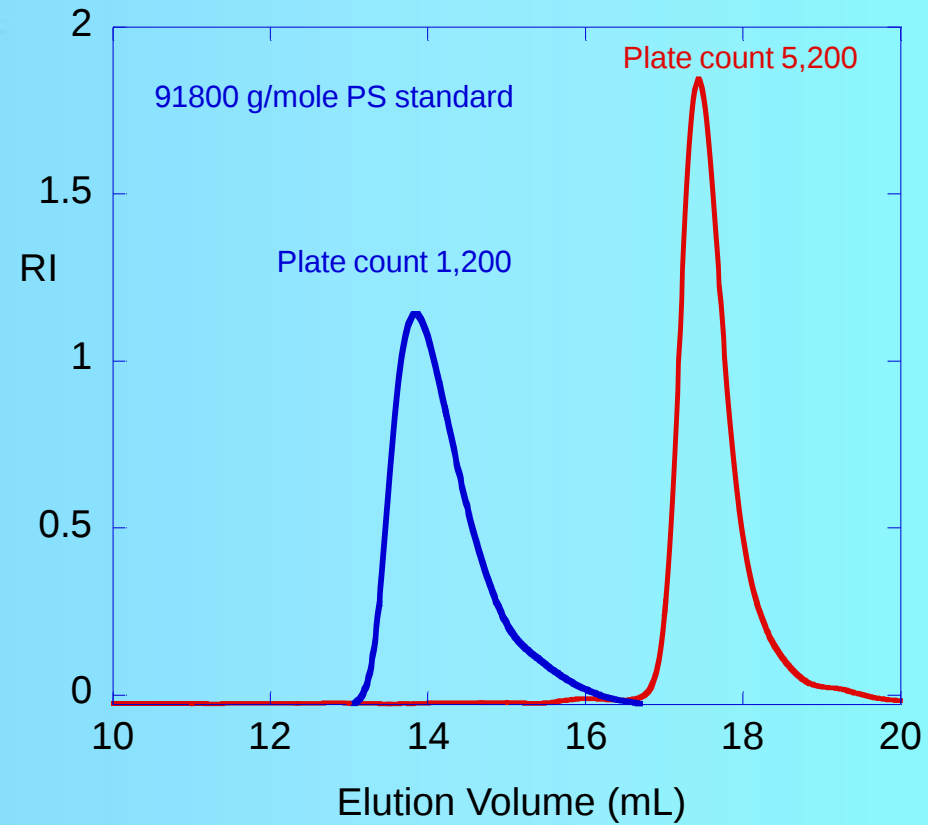
Sources of error due to GPC columns

Large M polymers outside the separation range of the column elute in the exclusion volume and will give false M values by standard calibration, and artificially low polydispersity



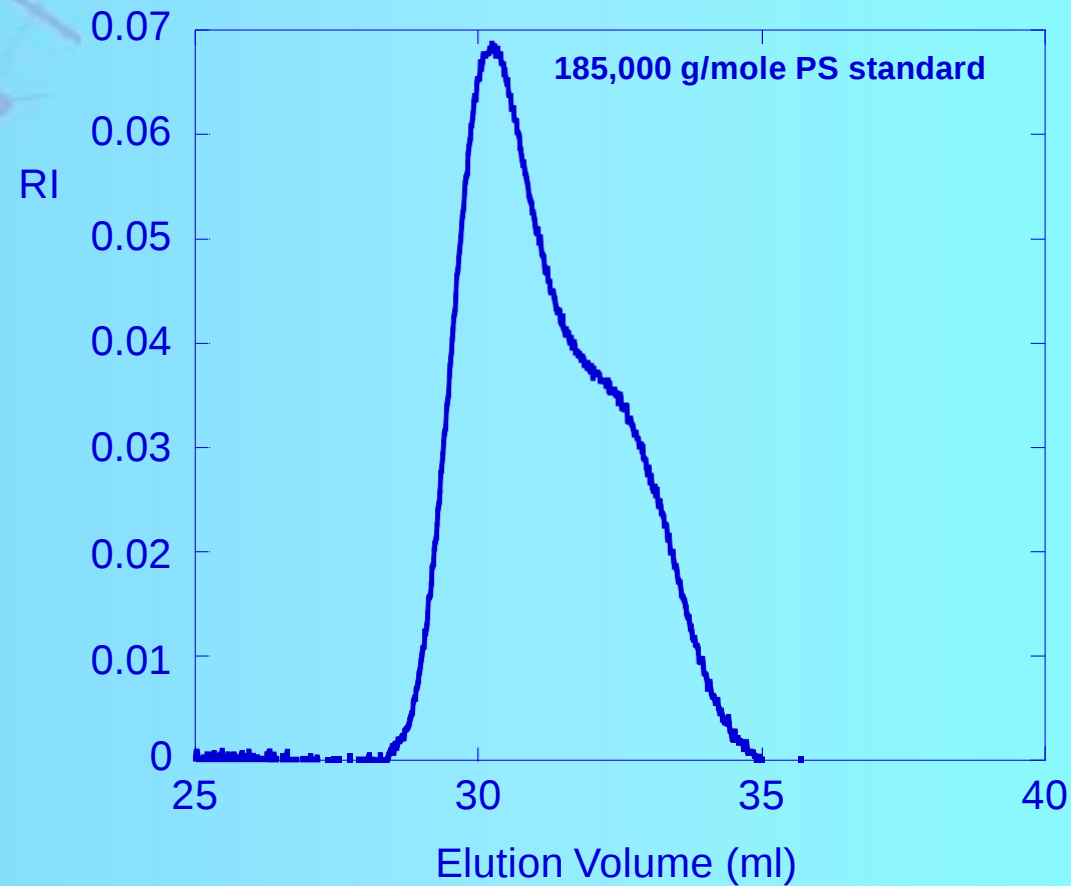
Sources of error due to GPC columns

Example of loss of resolution on a worn out column vs. a good column
(columns have different volumes)



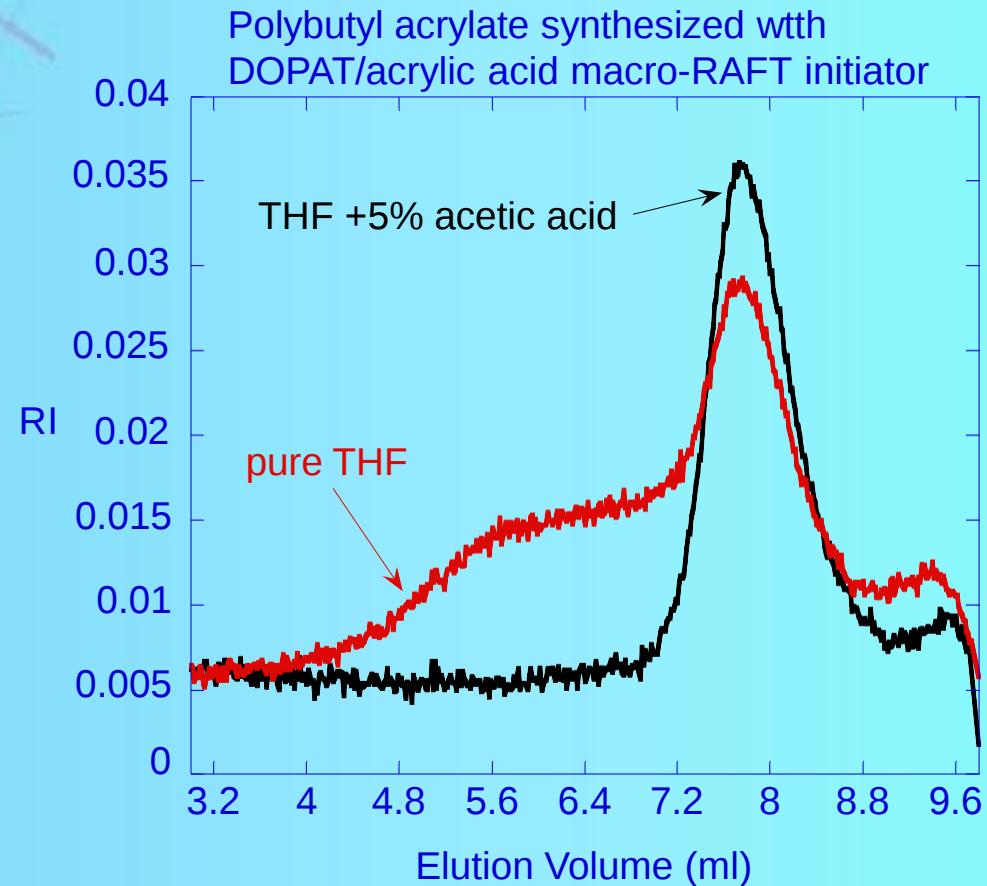
Sources of error due to GPC columns

Distorted/dual peak resulting from a bifurcated column or plugged column inlet frit



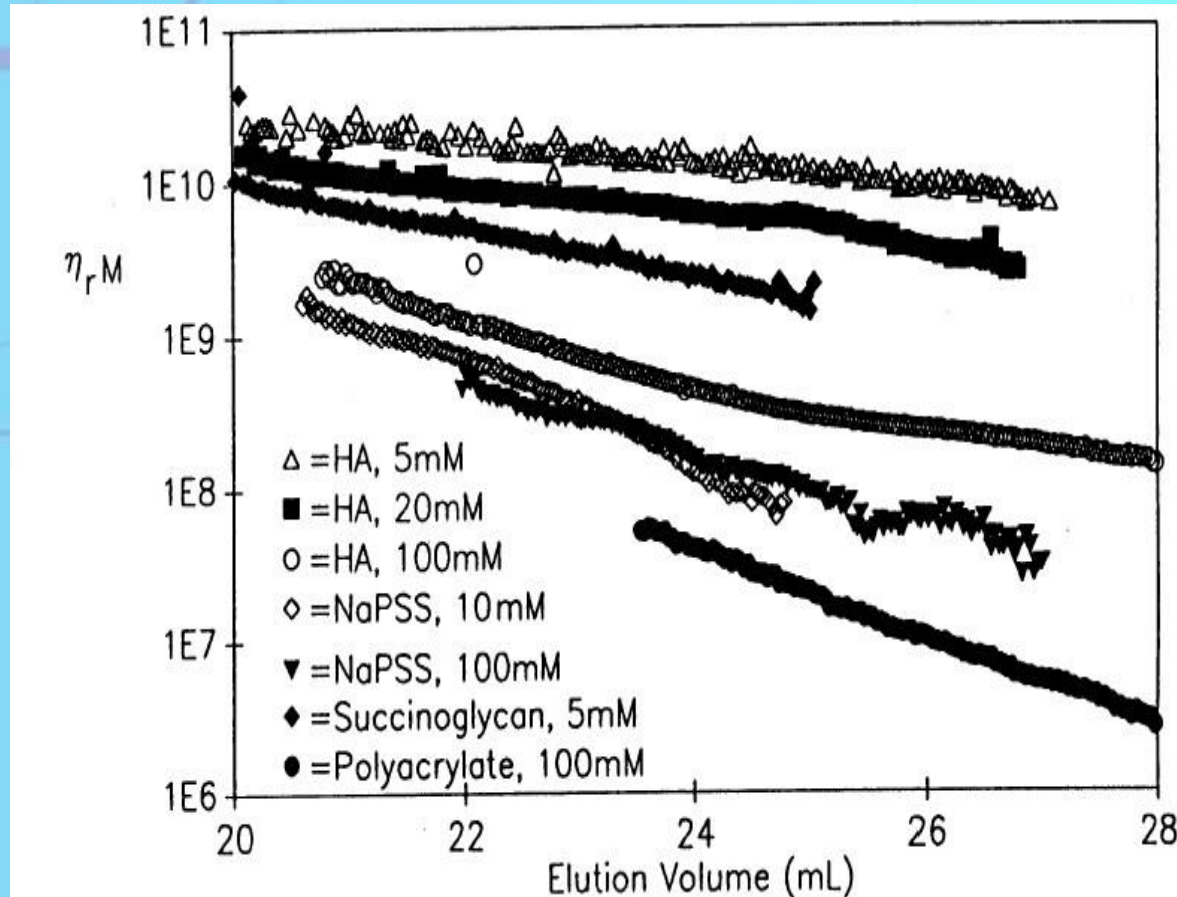
Sources of error due to GPC eluent

Improvement in elution behavior with addition of 5% acetic acid to THF



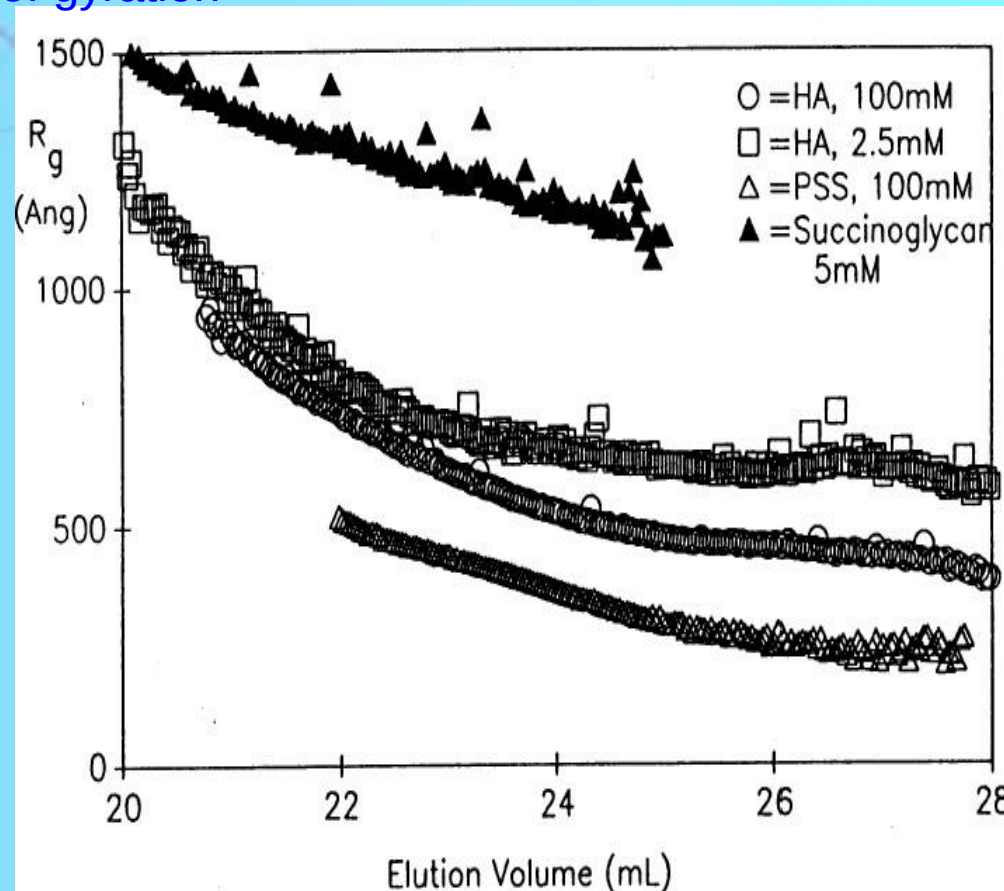
Sources of error in 'universal calibration'

Enthalpic effects Failure of 'universal calibration' for different polyelectrolytes in aqueous eluents of varying ionic strength



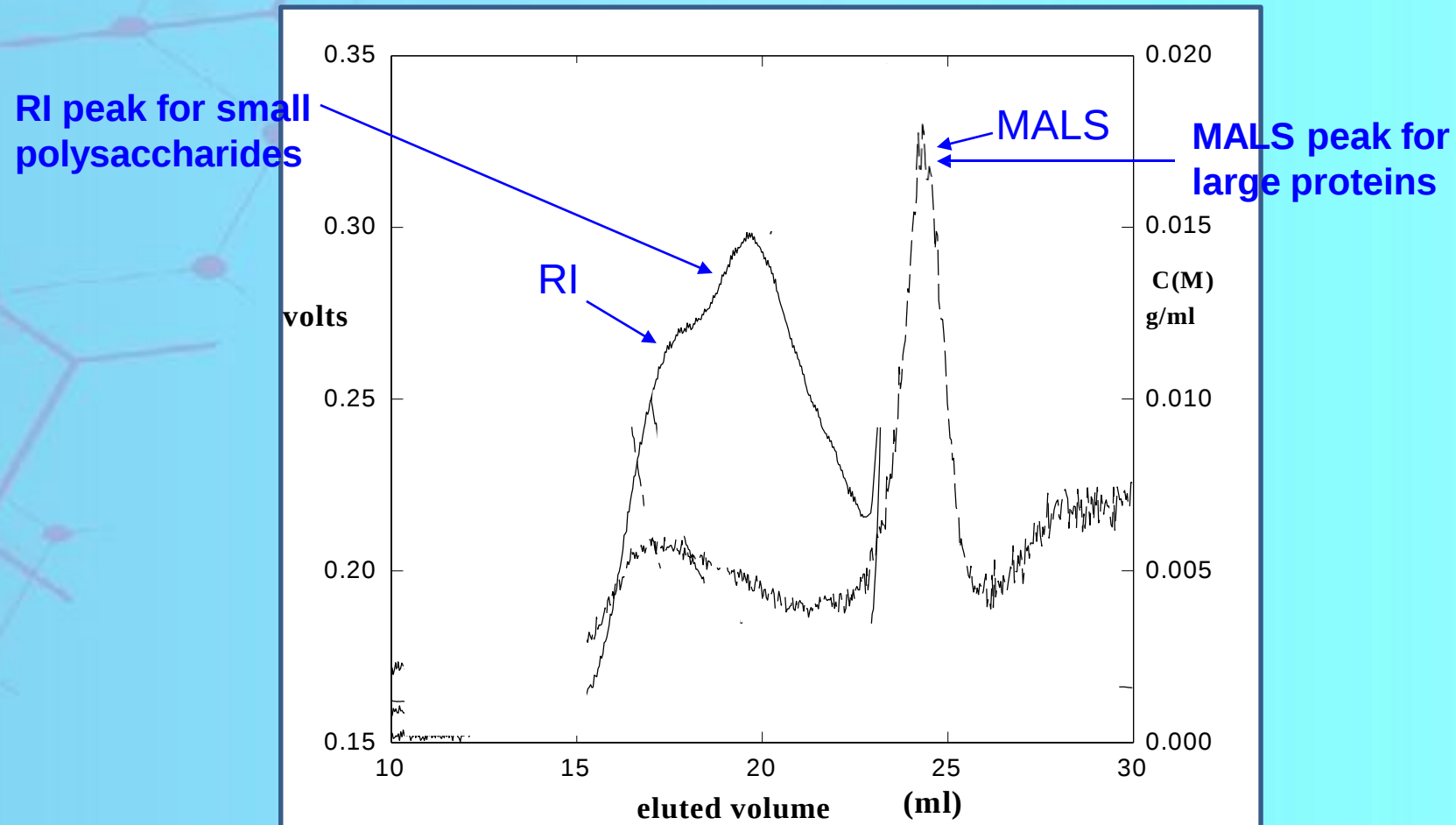
Sources of error in 'universal calibration'

Enthalpic effects: 'Universal calibration' for different polyelectrolytes in aqueous eluents of varying ionic strength separates neither according to hydrodynamic volume nor radius of gyration



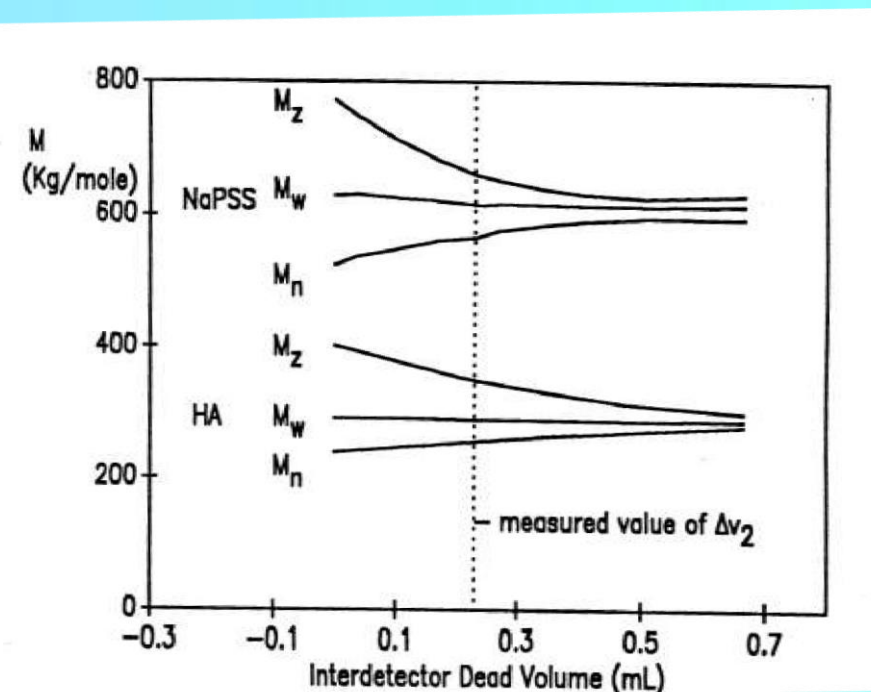
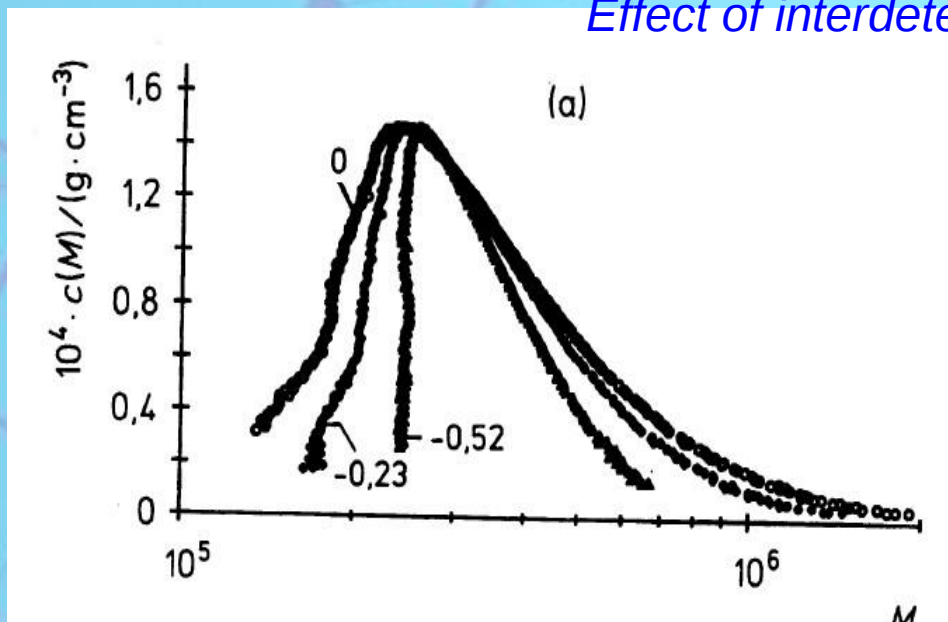
Sources of error

Mixed polysaccharides and proteins: Separation not by size exclusion. Small polysaccharides (<50,000g/mole) elute before large proteins (~500,000g/mole)



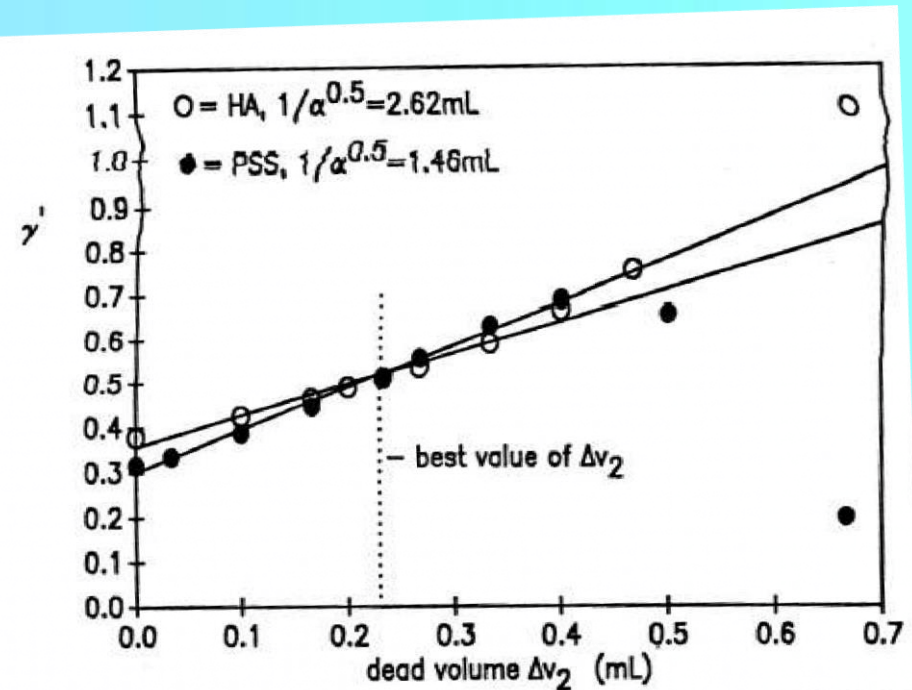
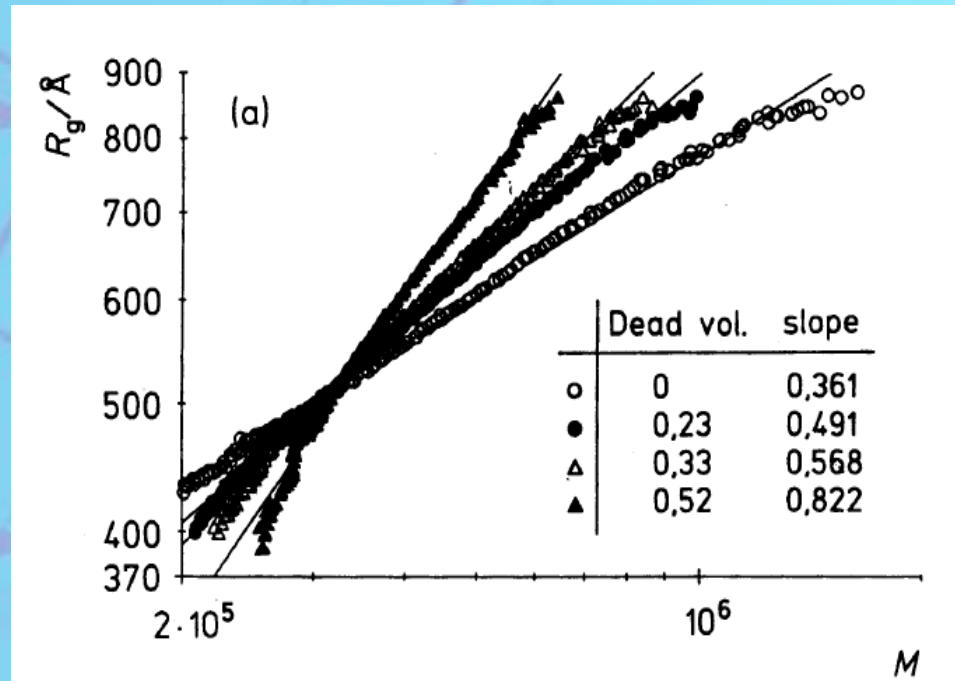
Sources of Error in Multidetector GPC

Effect of interdetector dead volume (LS-RI) on MWD



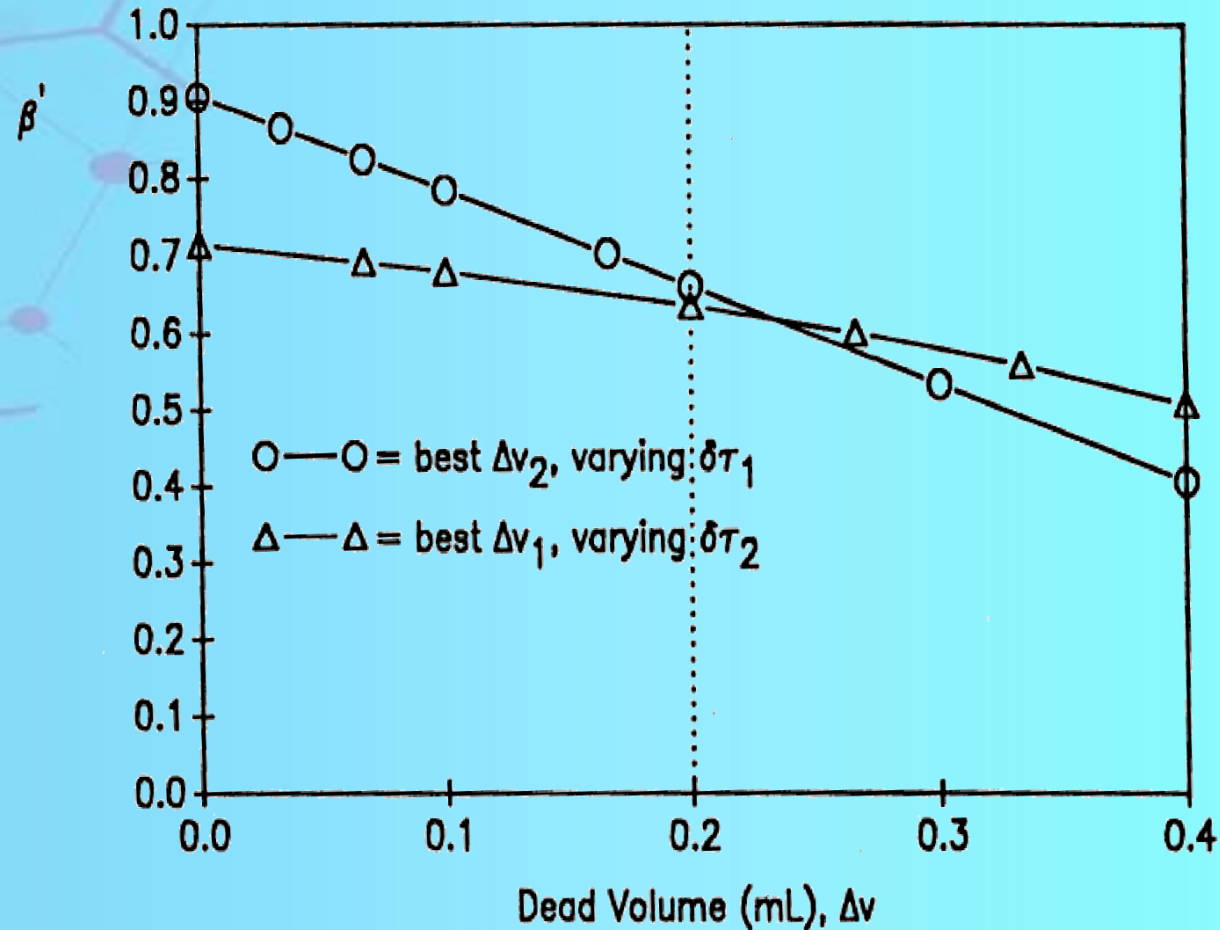
Sources of Error in Multidetector GPC

Extreme sensitivity of γ' in $R_g = AM^{\gamma'}$ to interdetector dead volume MALLS-RI



Sources of Error in Multidetector GPC

Extreme sensitivity of b' in $[\eta]=AM^{b'}$ to interdetector dead volume, Visc-LS and LS-RI



Sources of Error in Multidetector GPC

	dn/dc	CF	A_2	Anisotropic normalization	Dead volume
$\bar{M}_n$	$(dn/dc)^{-1}$ by Eq. (9) $(dn/dc)^{-2}$ by Eq. (10)	1/CF	Moderate. Proportional to width $1/\sqrt{\alpha}$ and $\sum c_i^2$ (Eq. (54))	slight underest.	slight
$\bar{M}_w$	same as $\bar{M}_n$	1/CF	Moderate. Similar to $\bar{M}_n$ (Eq. (55))	slight underest.	no effect to first order
$\bar{M}_z$	same as $\bar{M}_n$	1/CF	Moderate. Similar to $\bar{M}_n$	slight underest.	slight
$R_{z,w}$	no effect to 1st ord.	no effect to 1st order	Slight to mod. Increases with $(A'_2 - A_2)$ (Eq. (58))	slight to mod. Eq. (70)	slight in 1st order
$\eta_{z,w}$	(dn/dc)	1/CF	no effect to any order	none	no effect
γ	no effect	no effect to 1st order	no effect to 1st order	mod. to large overest.	highly sensitive
β	no effect	no effect to 1st order	slight	no effect to 1st order	extremely sensitive
$\bar{M}_w/\bar{M}_n$	no effect	no effect	slight increase with $(A'_2 - A_2)$	no effect to 1st order	underest. with incr. dead vol. error

Sources of Error

Effect of uncorrected RI drift on MWD

