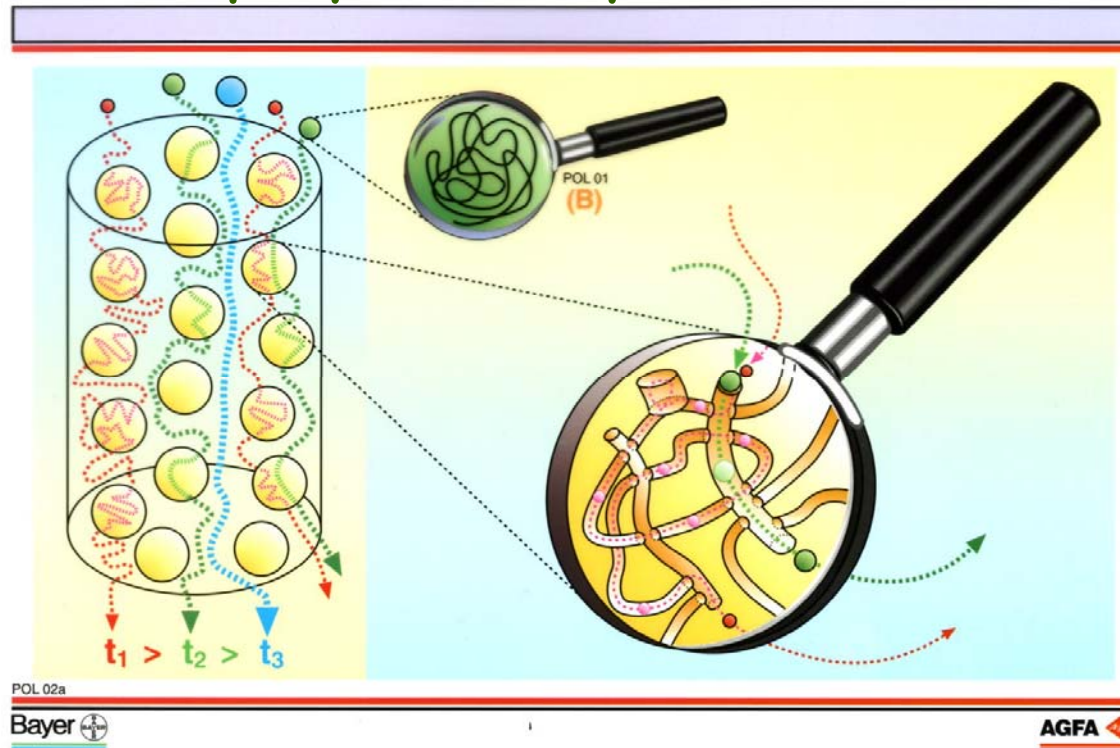


Size Exclusion Chromatography (SEC),

formerly known as GPC, is an analytical technique that provides information on molecular weights (M_w & M_n) and molecular weight distributions (M_w/M_n) of soluble polymers. The analysis is routinely performed by injecting approx. 1 wt-% polymer solutions in tetrahydrofuran (THF) onto the columns. The detection is performed by multiple detectors: refractometer, UV-detector, viscometer, light scattering. The data computation is based on different calibration standards: Polystyrene (PS), poly(methyl methacrylate) (PMMA) or poly(ethylene glycol) (PEG).

Aqueous solutions are not tolerated on the present instrumentation.

Separation of polymers by SEC - inside the column



SEC detectors

Refractometer = $K_{RI} \cdot dn/dc \cdot \text{concentration}$

UV-detector = $K_{UV} \cdot dA/dc \cdot \text{concentration}$

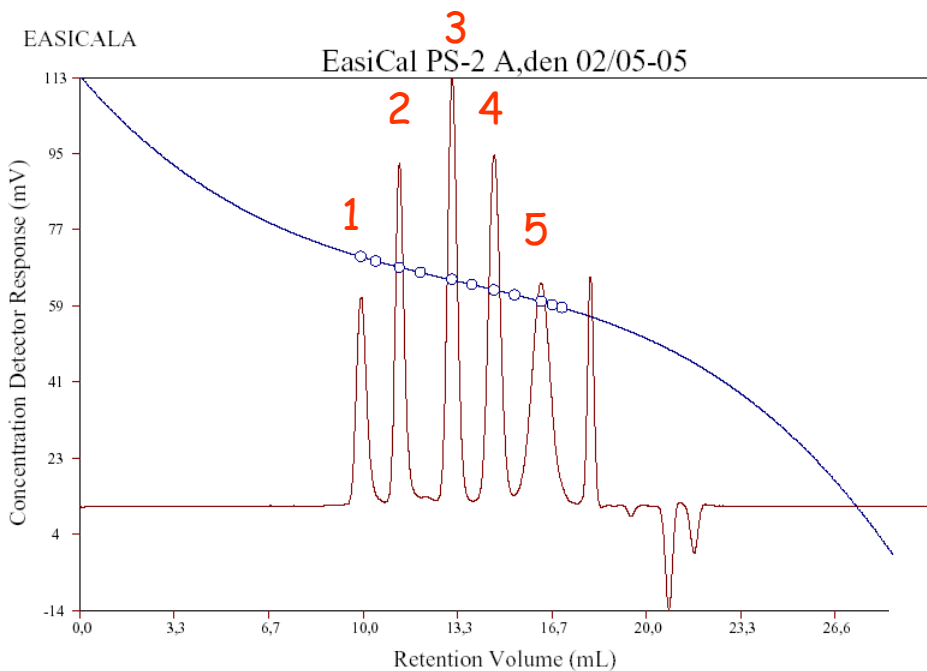
Viscometer = $K_V \cdot \text{Intrinsic Viscosity} \cdot \text{concentration}$

Light scattering = $K_{LS} \cdot \text{Molecular Weight} \cdot (dn/dc)^2 \cdot \text{concentration}$

K = instrument calibration standards; K_{LS} = constant for LALS at 7° , for absolute M_w

dn/dc = refractive index increment; dA/dc = extinction coefficient

Size Exclusion Chromatograms (SEC) of PS calibration mixtures on PTFE spatulas (~ 5 mg of each polymer mixture)



SEC of EasiCal PS-2, A

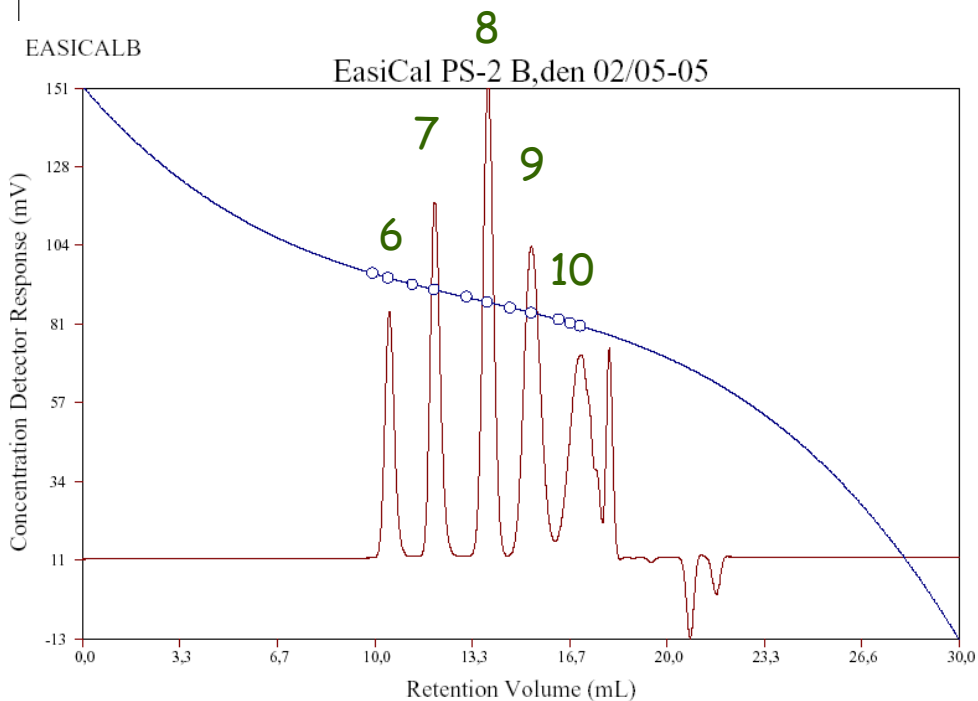
M_p

1	377,400
2	96,000
3	20,650
4	5,460
5	1,300

SEC of EasiCal PS-2, B

M_p

6	210,500
7	50,400
8	10,850
9	2,930
10	580



Overlay of SEC traces from ATRP of poly(pentafluorostyrene): conversion %, M_n (PDI = M_w/M_n)

