

1 Chemical structure of poly-DADMAC.

2 Comparison of SEC-MALLS and membrane osmometry.

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Sample	MALLS-GPC		Osmometrie	
	$M_w \times 10^{-3} [\text{g/mol}]$	$M_n \times 10^{-3} [\text{g/mol}]$	$M_n \times 10^{-3} [\text{g/mol}]$	$A_{2,0} \times 10^3 [\text{g/mol}]$
Poly-DADMAC 1	74	55	42	1.11
Poly-DADMAC 2	162	117	101	1.40
Poly-DADMAC 3	245	180	178	1.75
Poly-DADMAC 4	643	367	373	1.61

POLY-DADMAC STANDARD MATERIALS

Polydiallyldimethyl ammonium chloride (poly-DADMAC) is a commercial cationic polymer (Figure 1). It is used in many technical processes, e.g. as flocculation additive in the paper industry or for wastewater treatment. A series of poly-DADMAC samples with different molar masses was synthesized and characterized for the application as standard materials in process analytics. The molecular characterization of these materials was done by size exclusion chromatography, combined with a multi angle laser light scattering detector (SEC-MALLS). The number average of molar mass was additionally verified by osmometric measurements (membran osmometry). The obtained number average of molar masses from SEC-MALLS measurements for samples with molar masses smaller than 10^5 g/mol were too big (Figure 2). The detection of the low molecular fraction of the sample is increasingly difficult, therefore the high-molecular fraction is overestimated. In membrane osmometry the number average of molar mass is obtained from the

reciprocal value of the ordinate intercept of the P_{red} -c-plot. Additionally, from the slope of the gradient at low concentrations the 2nd virial coefficient can be obtained (Figure 3).

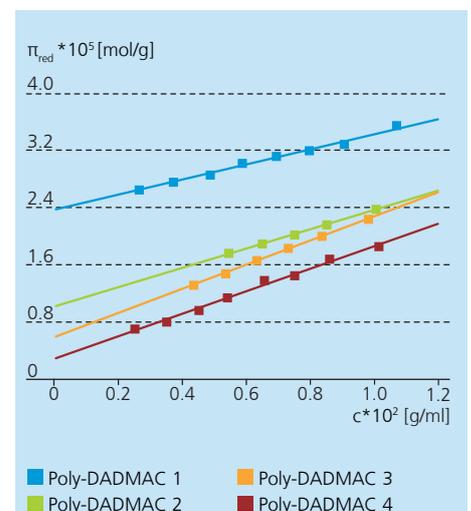


Fig. 3 Reduced osmotic pressure of poly-DADMAC samples with different molar masses plotted against the polymer concentration c .

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