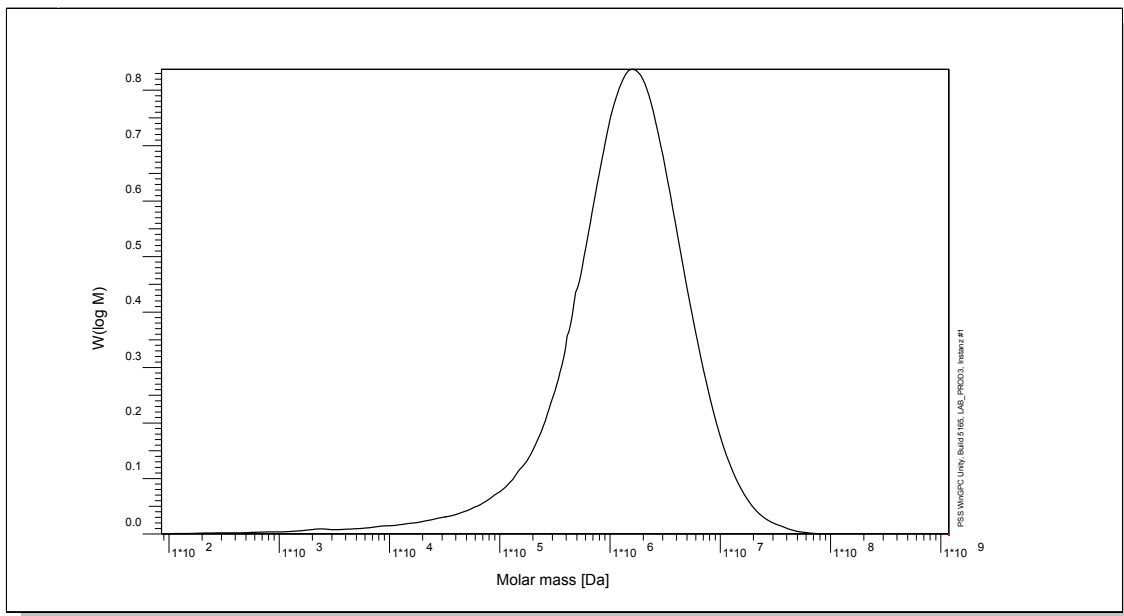


Certificate of Analysis

Polymer type: Poly(2-vinylpyridinium bromide)
 Part No: PSS-pvpq2.2m
 Lot No: vpq13058

Molar Mass Distribution



GPC/SEC - Conditions

| | | | |
|---------------------------------------|------------------------|---------------|--------------|
| Sample concentration | 1,00 g/l | Inject volume | 20 µl |
| Solvent | Formic acid 0.3M | Flow rate | 1,00 ml/min |
| Precolumn [8 x 50 mm] | PSS NOVEMA 10µm | Temperature | 25,0° C |
| Columns [analytical, each 8 x 300 mm] | PSS NOVEMA 10µm 3 000Å | | |
| Data Acquisition Software | PSS WinGPC | Operator | R. Leinweber |

GPC/SEC - Results

| Detector | Mw [Da] | Mn [Da] | Mp [Da] | PDI [Mw/Mn] |
|--------------|---------|---------|---------|-------------|
| HP UV 254 nm | 2288000 | - | 2234000 | < 1,20 |

Parent Poly(2-vinylpyridine) Molecular Weight: Mw [Da] = 860 000 Mn [Da] = 728 000 Mp [Da] = 840 000 PDI = 1.18

Molecular Weights are calculated with factor 2.66. (Factor 2.66 = M (pvpq) / M (pvp)).

Note:

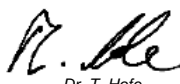
Mw = Weight average molecular weight
 Mn = Number average molecular weight
 Mp = Molar mass at the peak maximum
 PDI = Polydispersity Index

Degree of quaternisation with benzylbromide > 98 % / M (pvp)

Storage: Store the tightly recapped polymer standard in a dry, dark, cool area; e.g. a refrigerator (4 °C).

Date of expiry: See product label.

Manufacture control according to PSS method of analysis


 Dr. T. Hofe
 production director

