

# SEC-MALS of Low Molar Mass Compounds

**D**iglycidyl ether of bisphenol A (DGEBA, molar mass of 340 g/mol) and 4,4'-dihydroxydiphenylmethane (DHDPM, molar mass of 200 g/mol) were analyzed using size exclusion chromatography (SEC) combined with a multi-angle light scattering (MALS) detector in order to test the sensitivity and lower detection limits of a 30mW miniDAWN detector. DGEBA and DHDPM are of scientific and practical importance since they are the basic oligomers of epoxy resins and phenol-formaldehyde condensates, respectively, which are used in a variety of industries: from electronics to automotives.

Figures 1 and 2 show the MALS and DRI signals of DGEBA and DHDPM, respectively. An excellent signal-to-noise ratio was achieved for both compounds, which suggests that the sensitivity of the 30 mW GaAs laser in the miniDAWN is more than sufficient for working with these extremely low molar mass compounds.

### Reproducibility at low molar masses

Injection	Molar Mass [g/mol] <sup>a</sup>	
	DGEBA	DHDPM
1	374 ± 4	212 ± 2
2	370 ± 3	215 ± 2
3	368 ± 3	216 ± 2

<sup>a</sup> Results are reported with uncertainties calculated by ASTRA software.

The molar masses obtained from three injections of each compound are listed in the preceding table.

The specific refractive index increment,  $dn/dc$ , was determined using an Optilab interferometric refractometer operating at the same wavelength as the miniDAWN. The above data confirm that the 30mW laser (the same one in the DAWN EOS) is highly sensitive and provides excellent reproducibility and good accuracy (better than 10%), even for compounds below 500 g/mol.

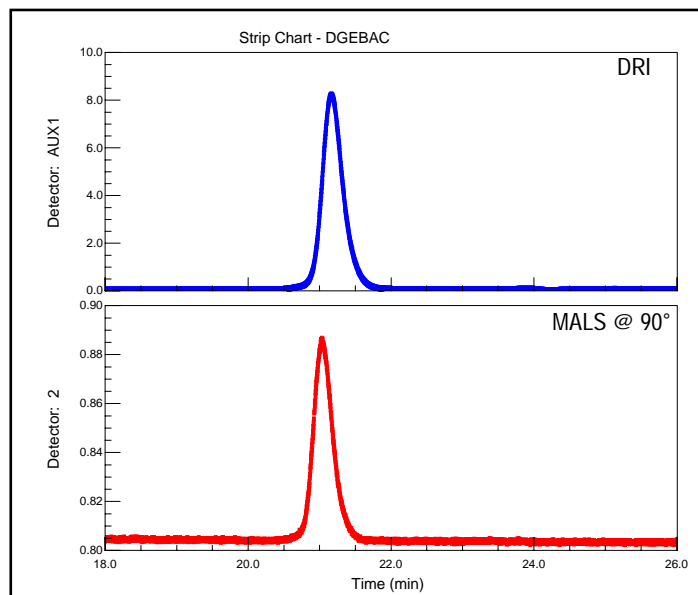


Figure 1. Despite a molar mass of less than 400 g/mol, the response of the 30mW miniDAWN is superb for the DGEBA.

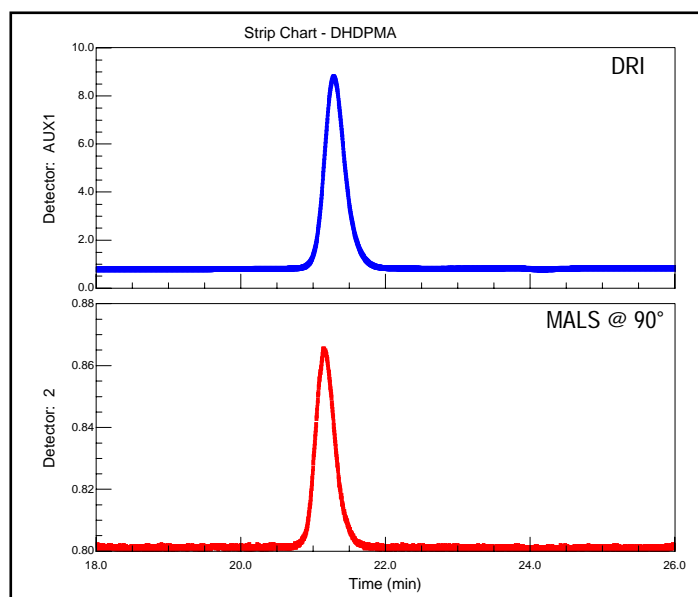
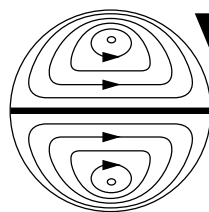


Figure 2. Despite a molar mass of less than 400 g/mol, the response of the 30mW miniDAWN is superb for the DHDPM.



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