

Molecular weight distribution of gluten proteins analysed by MALS

Gluten confers wheat flour the unique ability to produce viscoelastic doughs. The molecular weight distribution (MWD) of gluten proteins is one of the main determinants of physical dough properties. Since the 1980s HPSEC has been widely used to evaluate this parameter. Our research looked at analysing the MWD of gluten proteins with the aid of MALS in order to unravel new information about these polymers.

Flour extracts obtained *without* the aid of sonication (short term extraction using 50% aqueous acetonitrile added with 0.5% trifluoroacetic acid) or with sonication (same extractant, Branson sonifier 15" at 11W output) from Australian wheat cvs. Chara and Banks were subjected to HPSEC. Fifteen sub-fractions (0.25mL each) were collected from the first eluting peak to determine the molecular weight average (M_w) of the fractions. A Waters HPLC system, consisting of a 600 Controller, a 717plus Autosampler, and a 486 UV detector coupled with a miniDAWN detector was used.

Sonicated extracts from Banks showed a M_w of 1.307×10^7 whilst Chara's value was 1.120×10^7 . A different behaviour was found for the non-sonicated extracts with cv. Chara showing slightly *larger* polymer sizes (3.622×10^6 and 2.590×10^6 respectively).

Sonicated extracts from cv. Chara and Banks showed *larger* M_w than their non-sonicated extracts in the fractions collected from the void volume peak. Further studies to analyse the effect of varying sonication parameters on the size of the polymer will be undertaken.

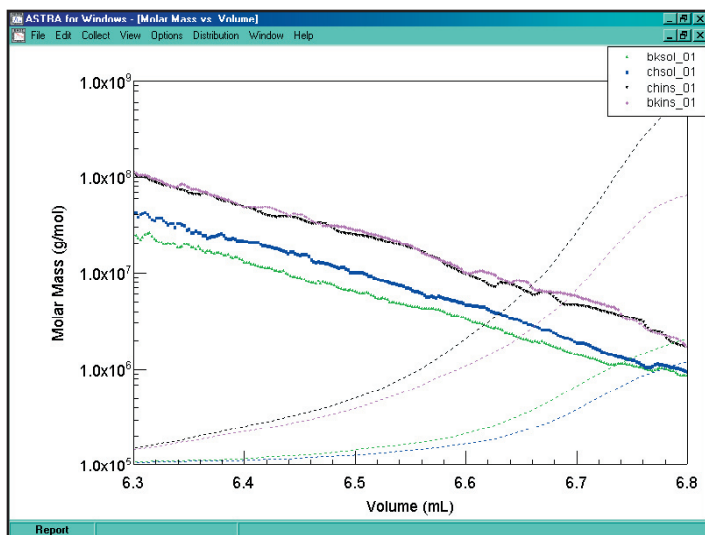


Figure 1. Sonicated extracts from cvs. Chara (chins) and Banks (bkins), and non-sonicated extracts from the same cvs (chsol and bksol).

