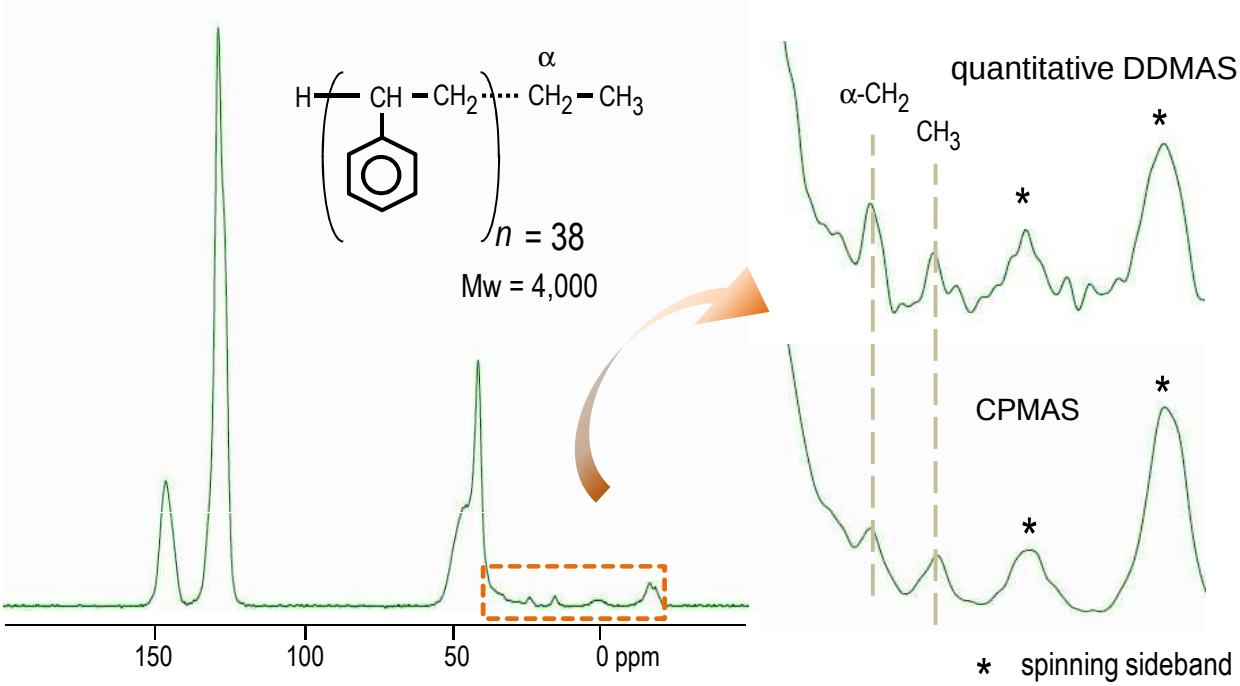
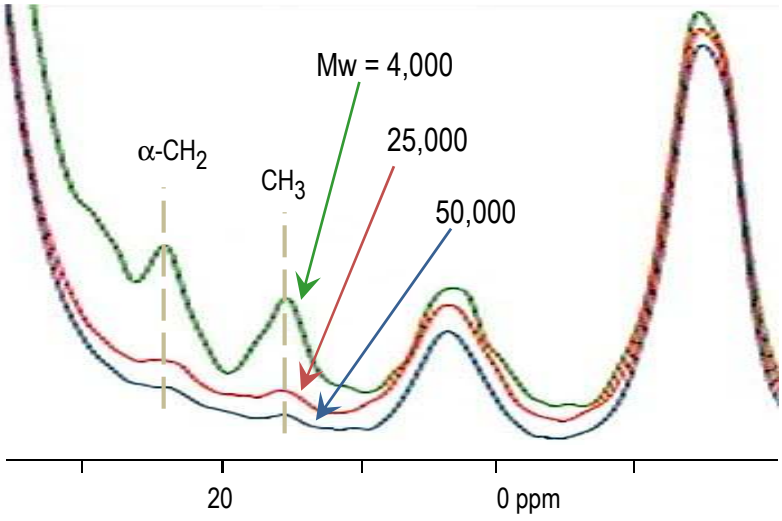
Evaluation of Molecular Weight of Polymer via ^{13}C CPMAS NMR Measurements: Terminal Carbon Signals of Polystyrene

^{13}C CPMAS measurements may be capable of satisfactory quantitative evaluation in some cases. The figure shown below is a quantitative DDMAS spectrum and a CPMAS spectrum of polystyrene (Mw = 4,000, monomer unit number = 38). From the intensity ratio of the terminal carbons (α-CH_2 and CH_3) and the other carbons, the unit number is estimated to be *ca* 40, indicating the possibility of molecular weight evaluation via ^{13}C CPMAS spectra.



The figure on the right shows CPMAS spectra of polystyrene samples of three different molecular weights Mw of 4,000, 25,000 and 50,000. Comparing with the signal intensities of the terminal carbons for the Mw = 4,000 sample, the intensity of the Mw = 25,000 sample is about 1/5 while the intensity of the Mw = 50,000 sample is about 1/10, demonstrating consistent molecular weights.



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