

Title: Hyphenating CEF and MALS detector: Challenges and
overcomes

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Abstract:

Note: maximum length of 400 words.

Triple detection gel permeation chromatography (GPC-3D) is widely used as a characterization tool on polyolefins industry. Although, few works are available in literature presenting results for TREF-3D^[1,2]. TREF is a complementary technique to GPC while investigation the molecular architecture of polyolefin resins. TREF as CEF, fractionate the sample according to its composition, based on polymer ability to crystallize, and redissolve. A triple detection is normally composed by an infrared, viscometer and light-scattering detectors.

In this work, an 8-angle light scattering from Wyatt was for the first time coupled to a Polymer Char CEF/TGIC instrument comprising an infrared (IR6) and dual capillary viscometer, both provided by Polymer Char. Several modifications were made in hardware, software and methodology in order to obtain a good signal to noise ratio and reproducible results. Additionally, different calibration conditions were tested to find the more accurate value of weight average molecular weight (Mw) along the chemical composition distribution for different samples.

[1] W.W. Yau, Macromol. Symp. 2007, 257, 29-45

[2] W. W. Yau, D. Gillespie, Polymer 2001, 42, 8947-8958