

Liquid Chromatography at Critical Conditions (LCCC) of Polyethylene.

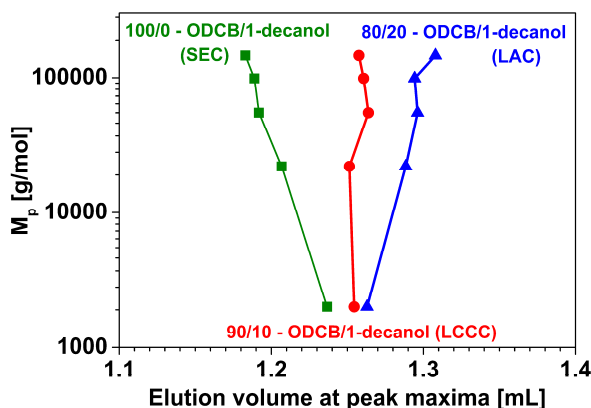
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High Temperature Liquid chromatography (HT-LC) is an important analytical tool for unravelling the molecular heterogeneities of polyolefins. HT-LC can be sub-divided into the separation modes of Size Exclusion Chromatography (HT-SEC), Liquid Adsorption Chromatography (HT-LAC) and Liquid Chromatography at Critical Conditions (LCCC). HT-SEC-based separations are entropy-controlled, and have been routinely applied to determine the molar mass distribution¹. HT-LAC has been developed recently with the finding that polyolefins can be reversibly adsorbed on graphite, and found application to determine the chemical composition distribution of polyolefins^{2,3,4,5}. The LCCC mode exists at the borderline between HT-SEC and HT-LAC where the entropy and enthalpy precisely compensate each other. At these conditions, the chains of a given polymer may be separated based on differences in their micro-structure, independent of their molar mass.

In this work, for the first time, LCCC of linear PE using porous graphite (Hypercarb™) as stationary phase in various mobile phases at 160 °C will be presented⁶. LCCC will be applied to separate statistical copolymers of ethylene/1-octene with similar molar mass.



Acknowledgement:

The support of this research by The Dow Chemical Company is gratefully acknowledged.

References:

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