

**Title:** Cloud Point temperature investigations – key information about slurry polymerization

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**References:**

Reference 1:

Ghosh, A.; Chapman, W.G., *Ind. Eng. Chem. Res.* 2002, 41, 5529.

Reference 2:

Macko, T.; Brüll, R.; Pasch, H., *Chromatographia* 2003, 57, S–39.

Reference 3:

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Reference 4:

Reference 5:

Reference 6:

Reference 7:

Reference 8:

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Reference 10:

Reference 11:

Reference 12:

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**Images:**

Images Guidelines:

*Please provide maximum one, on a separate file (doc, pdf, tiff, gif, or bmap), and at a reasonable resolution.*

**Abstract:**

### **Abstract:**

Slurry polymerization is a common production process for high-density polyethylene (HDPE). Characteristic of this type of process is the application of a diluent, such as a low-boiling hydrocarbon e.g., n-hexane. The diluent may partially dissolve the PE product, depending on the PE's molar mass. Low molar mass PE (wax) is a common, generally undesired by-product of the synthesis process and particularly prone to solubilization. As polymer solubilization plays a key role in the generation of PE wax and the issues it causes, understanding the composition and amount of solubilized polymer is essential for an optimization of slurry production.

Polymer solubility can generally be modelled well employing models based on the quantification of solid-liquid equilibria (SLE). However, experimental data on polymer solubility is a key input in the development of such models and exactly that data has been sorely missing. We now employed a self-developed experimental setup for determining Cloud Point temperatures to obtain these data. Cloud Point temperature refers to the temperature at which a polymer solution transitions to a dispersion. The setup used in the study was specifically designed to determine Cloud Point temperatures at temperatures above a solvent's boiling point. This allowed to determine Cloud Point temperatures for PE in low-boiling hydrocarbons, such as the ones applied in the slurry process. Information on the interdependence of polymer properties/physical conditions and the obtained Cloud Point temperatures will be revealed in the poster.