

## **Sample Preparation and HT-GPC Analysis of Ultra high Molecular Weight Polyolefin and the effect of Temperature.**

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Gel permeation chromatography is a common and important technique in the analysis of polyolefin. Polyolefins are difficult to analyze mainly due to their relatively high crystallinity and thus their low solubility, and as such require aggressive solvent conditions and extremely high temperatures to promote solution. However, due to these harsh conditions and especially due to the exposure of high temperature both during sample preparation and analysis the polymer can be seriously degraded and thus the true molecular weight of the polymer can be difficult to obtain.

Despite this difficulty, polyolefin is widely analysed by GPC across the globe, and a range of sample preparation and analysis conditions are applied.

The paper discusses the effect of sample preparation and analysis temperatures on the chromatography of ultra-high molecular weight polyethylene (UHMWPE). The study includes the effect of dissolution temperature, the reduction of oxygen during preparation and the time of exposure to high temperature, all of which depend greatly on the molecular weight of the sample. Although it is difficult to define exact sample preparation and analysis temperatures and conditions, certain guidelines and operation practices can help reduce the effect of sample degradation.