

Liquid Crystal Polymers for Non Reconstructing Fluorinated Surfaces

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HF₈: The reference polymer was prepared following previous described procedure^{1,2} via a free radical polymerization with Azobis-isobutyronitrile (AIBN-Vazo[®] 64 - 0.4% molar) as thermal initiator: 2.39 mmol of the monomer were placed in 1 mL of anhydrous toluene in a three neck flask initially purged three times with nitrogen. The monomer solution was purged using nitrogen and AIBN was added. The solution was then stirred at 85 °C for 16 hours under an oxygen-free nitrogen atmosphere. Purification was achieved by cycles of solubilization in chloroform followed by a precipitation in methanol. The polymer was finally dried under vacuum to give a white solid. 1.21g (98% yield, GLC purity > 99%, GPC in forane 113: Mw = 19.500 g/mol, PD = 2.1). ¹H NMR. (CDCl₃/TMS, δ ppm J Hz) : 1 – 2.2 (3H, CHCH₂), 2.50 (2H, CF₂CH₂CH₂, tt, J_{HH}=8.81, J_{HF}=17.86), 4.50 (2H, CF₂CH₂CH₂, t, J=8.81). ¹⁹F NMR (CDCl₃/CFCl₃, δ ppm): -81.0 (2F, CF₂), -114.7 (6F, CF₂), -122.8 (2F, CF₂), -123.4 (2F, CF₂), -124.0 (2F, CF₂), -126.6 (3F, CF₃).

1 S. Saidi, F. Guittard, C. Guimon, S. G ribaldi, *J. Polym. Sci. Part A Polym. Chem.*, 2005, **43**, 3737.

2 S. Saidi, F. Guittard, C. Guimon, S. G ribaldi, *Appl. Polym. Sci.*, 2006, **99**, 821.

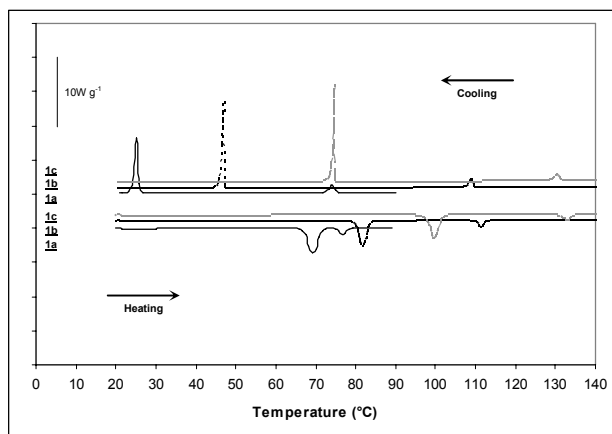
Results of TGA

Polymers	IDT	T _{1%} °C	T _{5%} °C	T _{10%} °C	T _{50%} °C	T _{max} °C
HF ₄ C ₀	220	235	297	322	364	369
HF ₆ C ₀	215	243	307	331	370	373
HF ₈ C ₀	190	201	293	326	373	376
HF ₈ C ₂	180	185	239	274	356	497
HF ₈ C ₁₁	112	123	203	280	362	384

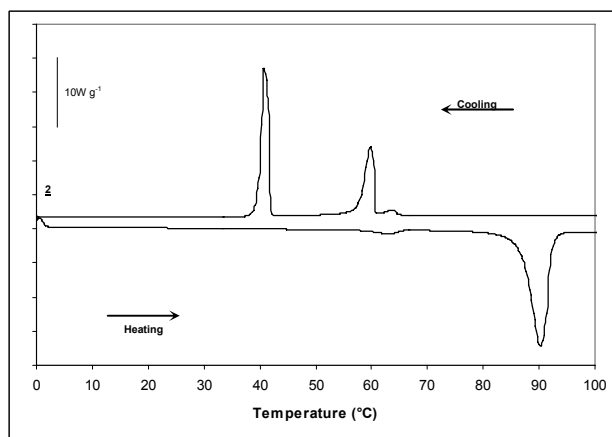
IDT: Initial Degradation Temperature, T_{1%}, T_{5%}, T_{10%}, T_{50%}, respectively temperature with a loss of 1, 5, 10, 50 % of the initial mass. T_{max} temperature with maximal degradation ratio (dm/dT max).

DSC traces for monomers

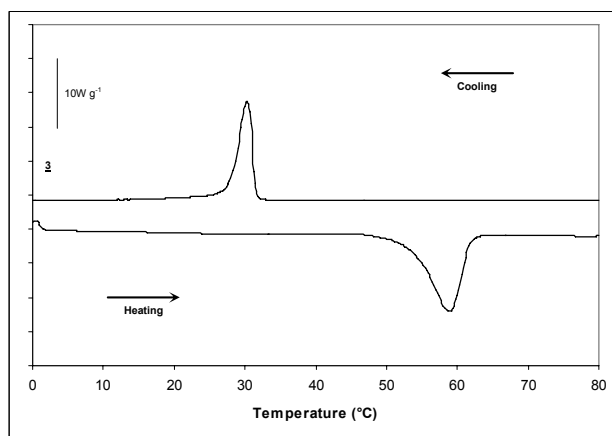
1a, 1b, 1c



2

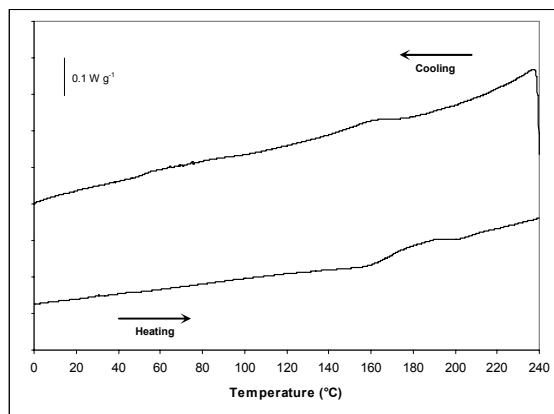


3

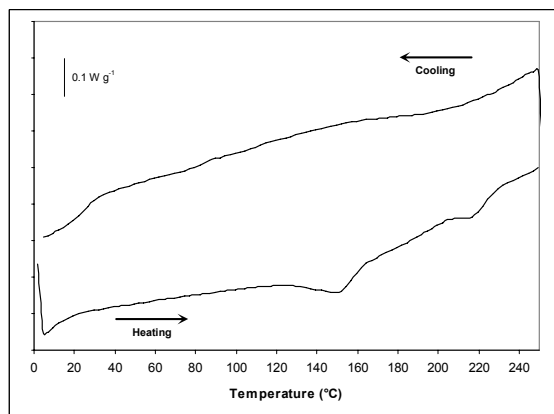


DSC traces for LC polymers

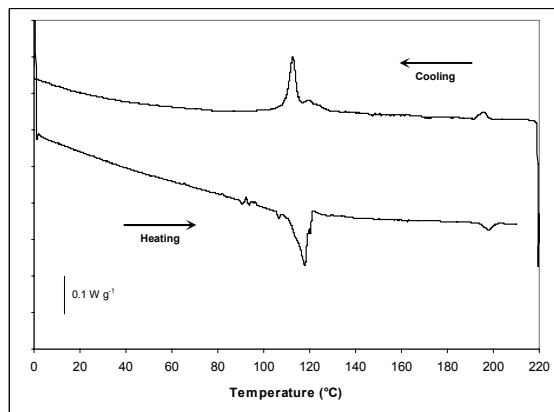
HF₆C₀



HF₈C₀



HF₈C₂



HF₈C₁₁

