

## Report : experiment n° 02-01-32

This work concerns the solid-state properties of unswollen fully conjugated poly(3-n-octylthiophene) (POT) gels prepared from oxidative copolymerization of tri(2'-thienyl)-1,3,5-benzene units with octylthiophene units. Nine shifts have been allocated on beam line D2AM (experiment n° 02-01-32) to elucidate the structure of these gels. Results of these measurements have been published. This report gives the abstract of the corresponding article in Polymer [1].

Abstract : Solid-state properties of undoped gels of poly(3-n-octylthiophene) (POT) are investigated by N<sub>2</sub> BET surface measurements, X-ray diffraction and small angle x-ray scattering (SAXS) experiments. The observed variations in compacity, crystalline domain sizes and typical sizes of large-scale heterogeneities versus the crosslink ratio,  $R_i$ , all exhibit an extremum for the gel  $R_i = 1/100$ . As reported earlier, this gel in the doped state also exhibits the highest conductivity. A major interest in the crosslinking process is to enhance the conductivity by modifying POT crystallinity. A deeper understanding of the crystallization mechanisms should therefore allow one to master the transport properties in POT systems.

## Reference :

[1] B. Pépin-Donat, A. de Geyer, A. Viallat, Polymer, **39**, 6673 (1998).