



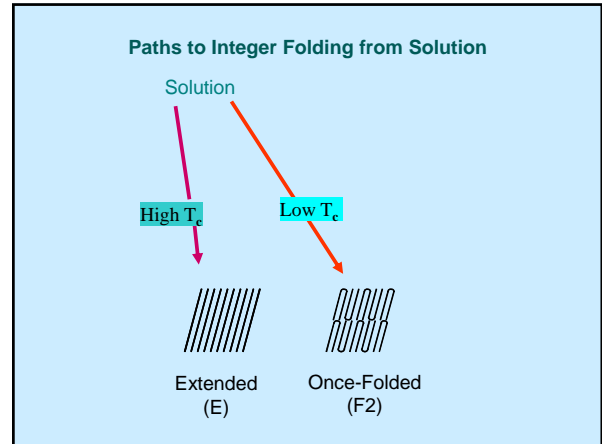
**Physics of Solid Polymers**  
Part 4  
**Ultralong Monodisperse *n*-Alkanes**

- Up to  $C_{390}H_{782}$
- Strictly uniform in length
- Models for understanding crystalline polymers, e.g. polyethylene

- First synthesised by **Marc Whiting**, Bristol, 1985.
- Most samples in this work by **Gerald Brooke**, Durham

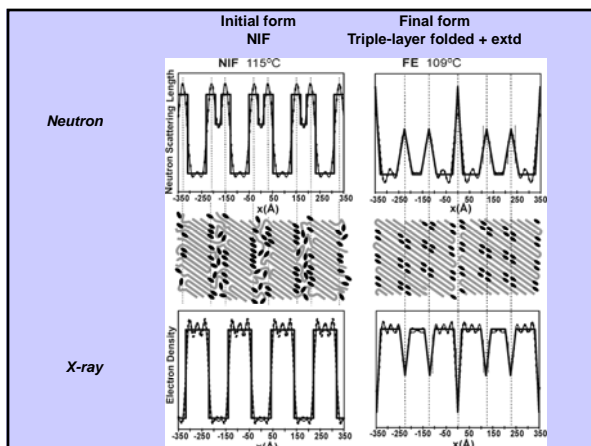
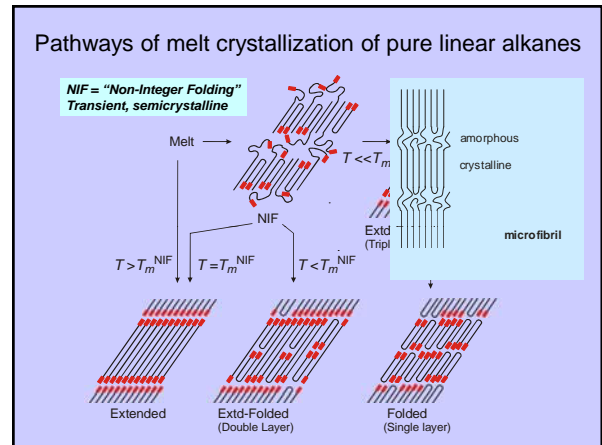
See reviews:

- G. Ungar et al., *Adv. Polym. Sci.*, 2005 **180** 45-87.
- G. Ungar, X.B. Zeng, *Chem. Rev.*, 2001 **101** 4157-4188



**“Integer” folding**

chain conform.	E	F2	F3	F4	F5
paraffin		∩	∪	∩∪	∪∩
$C_{102}H_{206}$	+				
$C_{150}H_{302}$	+	+			
$C_{198}H_{398}$	+	+	+		
$C_{246}H_{494}$	+	+	+	+	
$C_{294}H_{590}$	+	+	+	+	+
$C_{390}H_{782}$	+	+	+	+	+



**Binary mixtures of long alkanes**

- Model polymer systems with controlled polydispersity.

$C_{162}H_{326} + C_{246}H_{494}$  1:1 w:w

$C_{162}H_{326}$  (208Å): \_\_\_\_\_

$C_{246}H_{494}$  (315Å): \_\_\_\_\_

Short alkanes (<50 C-atoms) do not co-crystallize.

