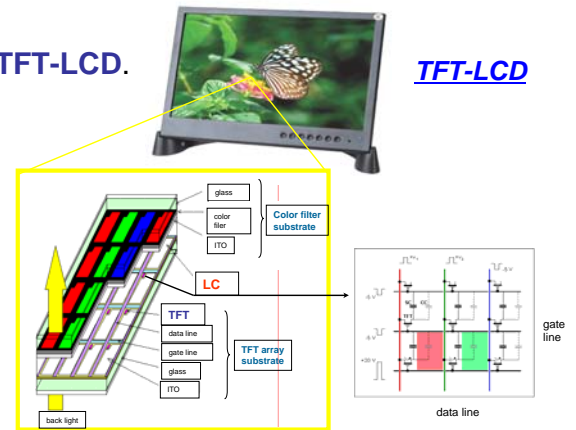
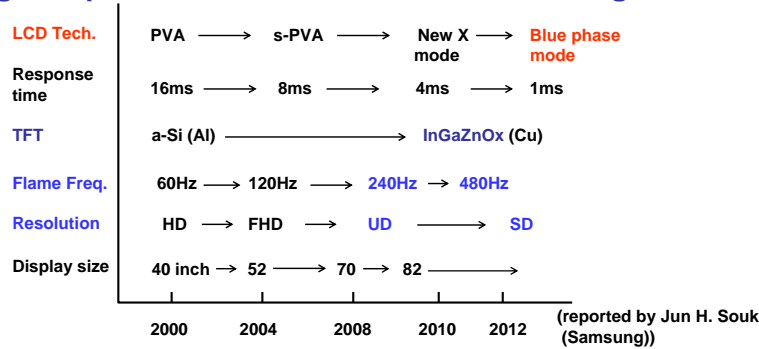


Polymer-Stabilized Liquid Crystalline Blue Phases for Display

Prof. Hirotugu KIKUCHI (Kyushu University)

1. TFT LCD Technology Load Map (Samsung)

- High response LC material is needed in Next generation TFT-LCD.



2. Comparison of conventional liquid crystals and our blue phase materials

	Polymer-stabilized blue phases	Conventional Nematics
Molecular alignment	LC molecule Double twist cylinder 100 nm	LC molecule
Optical property	Isotropic	Anisotropic
Surface treatment	Unnecessary	necessary
Response time	< 1 ms	several ms
Temperature range	$\Delta T=1-2K$ $\times \rightarrow \bigcirc$	\bigcirc

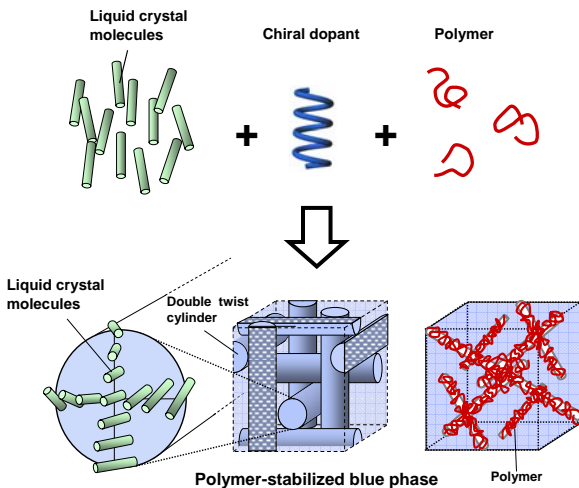
- Blue phase has two major advantages over commonly used nematic phases in LCD.
- However, blue phase so far appears in a very narrow temperature range ($\Delta T \sim 1K$)



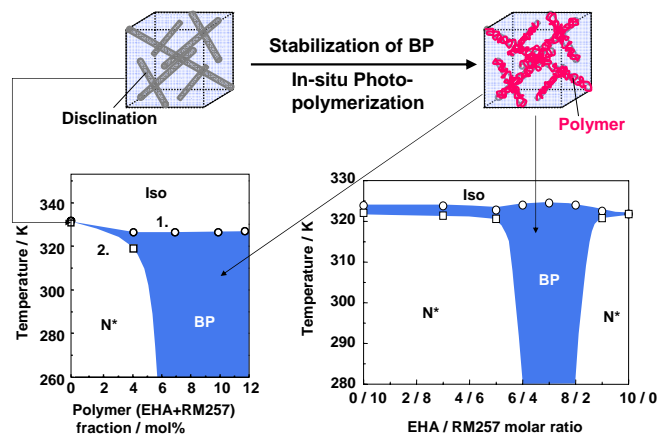
Our polymer-stabilized blue phases are allowed to expand temperature range ($\Delta T > 100K$).

3. Polymer-stabilized blue phases

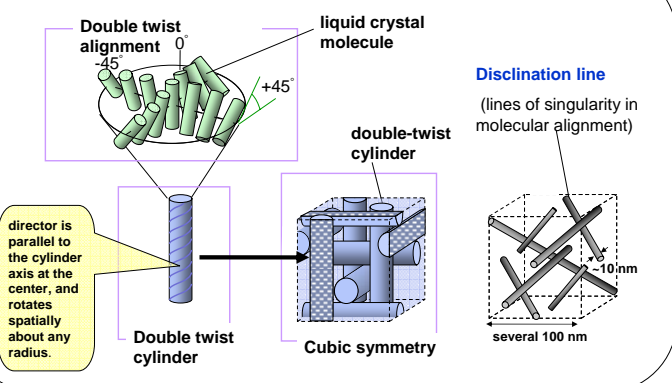
- Composition profile



- Data of expanding temperature range



Structure of BP



4. Patent status & Patent owner contact

- Patent license is available.

Patent No. : WO2005-090520, JP3779937
 Apply country : JP,US,CA,EP,KR,CN,TW
 Patent owner contact: Masaru OZAKI (JST)
 Tel:+81-3-5214-8486
 e-mail: license@jst.go.jp