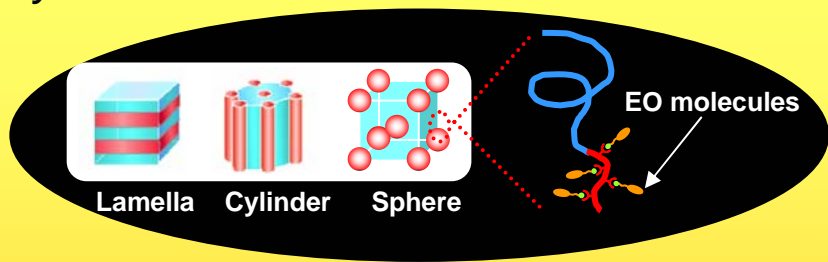


Hydrogen-bonded self-assembled polar subunits as nanostructured electro-optic materials

Padma Gopalan, Department of Materials Science and Engineering, University of Wisconsin-Madison

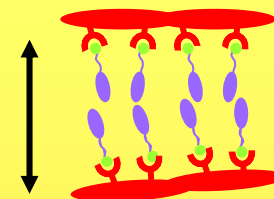
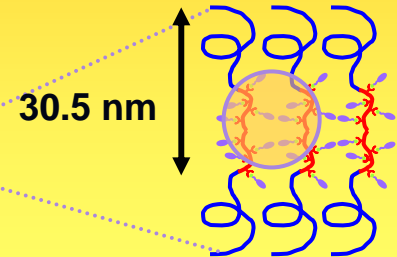
The basic principle in nanostructured materials, of confining a functional subunit (biologically active or electroactive unit) within specific size and shape is especially relevant to nanostructured electro-optic materials (EO). *Block copolymer ordering can be exploited to enhance the orientation of the chromophore dipoles, by confining within a domain of specific size and shape. The advantage being uniform control over domain size compared to guest-host systems.*



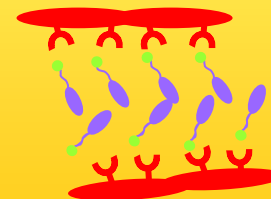
Block Copolymer with H-bonded EO chromophores

In addition to the domain shape, the distribution of chromophores within the domains and the thermal history of the sample are critical to maximizing the EO coefficient.

Cartoon on mechanism of poling within the PVP domain

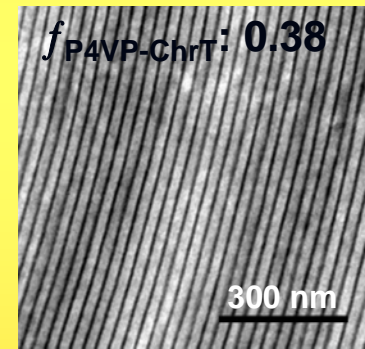
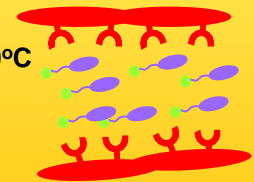


Heat to 90°C
E-field



Heat to 150°C

Cool to rt
E-field on



Lamella
d: 35.5, 37.8 nm