

coherence length, ζ

Also contains definitions of: electric coherence length *in thin films*, ξ_E ,
magnetic coherence length *in thin films*, ξ_M

in thin films

The distance over which order is maintained. As an example, there can be long-range atomic or molecular order, i.e. coherence. Coherence lengths are significantly larger than molecular size. Normally, coherence length is estimated from electron, neutron or X-ray scattering and scales the size of ordered domains in material where long range ordering occurs (as in liquid crystals, for example). The term coherence length is also used for the scale characterizing the profile of molecular axis orientation in the distorted, so-called, transition layers formed at a solid/liquid-crystal boundary when an appropriate external field is applied (e.g. when the orientation of anchored surface molecules of a nematic liquid crystal is unaffected by an external field -- magnetic or electric -- whereas the bulk molecules reorient freely). This scale is referred to as electric coherence length, ζ_E or magnetic coherence length, ζ_M , depending on the nature of the applied field.

Source:

PAC, 1994, 66, 1667 (*Thin films including layers: terminology in relation to their preparation and characterization (IUPAC Recommendations 1994)*) on page 1675