

How do the organic nanostructures differ from the inorganic nanostructures?

Following Table presents the comparison between the organic (oligomeric and polymeric) and the inorganic nanostructures in the size range of 3~50 nm.

No.	Aspect	Inorganic nanostructures	Organic oligomeric nanostructures	Organic polymer nanostructures
1	Illustrative materials	Nano TiO ₂ , Nano ZnO, Nano Silica	Micelles, Vesicles, Self assembled Monolayers (SAM)	Nano-emulsion polymers, Nanofibres, Nanofilms, Proteins, DNA
2	Molecular weight	40~ 300	Upto 2000	2000~2,000,000
3	Molecular size (Average)	0.1~ 0.5 nm	2~5 nm	Upto 50 nm
4	Molecular polydispersity	~ 1.0 Monodisperse	1.1~ 1.3 Narrow distribution	1.4~3.0 Broad Distribution
5	Number of molecules per nanoparticle of 3~50 nm	20 ~ 100	3~20	2~5
6	Molecular shape	Fixed	Flexible	More flexible: Folded, Coiled, Stretched
7	Phase strength	Rigid	Soft	Soft to semi-rigid
8	Nature of Bonding	Electrovalent, covalent, metallic	Covalent	Covalent
9	Molecular self similarity	All molecules identical	High degree of similarity	Molecules differ substantially

10	Nature of surface	High degree of order	More disorder	High disorder
11	Self assembly	Interparticle	Interparticle or Intermolecular	More Intermolecular

(Organic crystalline materials like pigments are excluded from this comparison.)
