What are the drivers for induction of nanotechnology into coatings?

A glance at the Table will indicate the potential that the nanomaterials hold forth to the coatings industry.

	Driver	**Implication**	**Potential nano materials**
1	Upgradation of price/performance ratio	Improved film properties like hardness, UV resistance, color development, antimicrobial	Zinc oxide, silica, clay, alumina, cerium oxide, TiO2, iron oxide, barium sulfate, calcium carbonate, colorant dispersions, metallic silver
2	Special function or premium coatings	Conductive, fire retardant, color effects, luminescent, safety & security, hydrophobic, hydrophilic	Carbon nanotubes, hybrid polymers, quantum dots, nano pigments, nano fillers
3	Energy efficient processes to contain climate change	Low temperature production (resins) and paint curing processes	Nano particle catalysts, hybrid cross linkers
4	Petroleum price challenge	Waterborne products with solvent borne properties, powder coatings	Nanophase emulsions, nano fillers
5	Eco friendly products	Low VOC , free of heavy metals and HAPS	Nano fillers, nano-clay polymer composites , nano particulate driers

Table: Drivers of coating technology

It is obvious that nanotechnology is not a panacea for all the technological constraints, but a powerful tool to be used judiciously and ingeniously to address the emerging needs. Nanotechnology will have to be harnessed in tandem with the other upcoming

technologies like ‘controlled radical polymerization’ and ‘post cross linkable waterborne resins’ to develop sophisticated coatings.
It is, therefore, imperative for the coatings technologist to study nanotechnology in depth from the first principles with a view:

- To exploit opportunities offered by the suppliers of nano materials
- To eliminate waste of efforts in misdirected evaluation of nanomaterials
- To build in-house and in-situ process for nano-synthesis during different stages like resin production, paint making and paint application.