

Why has the progress been slow in induction of nanotechnology into coatings?

- Knowledge gap: Coatings researchers often perceive nanomaterial as an ingredient to be sourced from vendors and to be incorporated into paints for upgrading certain properties. While this is a good starting point, the potential of nanomaterials needs to be understood holistically in greater depth. This calls for education in nanoscience to comprehend its enabling power to 'change the rules of the game' in coating technology. Nanotechnology ought to be looked upon as a 'platform' for launching new developments and not merely a material to be incorporated.
- Inadequate investment: The coating companies need to make serious investment in multidisciplinary in-house research with a team of experts in different fields dedicated to exploration of nanomaterials with a long term view.
- System specific performance: Although the basic nano building blocks may possess novel properties, it is very important to deliver those properties through a formulated coating for a specific application. This is a challenge by itself as paint comprises multitude of materials like pigments, polymers, solvents and additives. These will have physico-chemical interactions with the nano building blocks thereby impacting the performance synergistically or antagonistically.
- Vendor dependence: Joint work with vendors is important, but the 'plug in' approach will yield only limited benefits. While this approach exploits the capabilities of the suppliers in manufacturing of nanomaterials, it is constrained by their limited knowledge in application and system specificity.
- High cost: Presently the cost of the available nanomaterials for coatings is often exorbitant which increases the product cost disproportionate to the improvement in performance. This may be due to the exotic methods of synthesis and low volumes.
- Scalability: Paint as a product category is 'high volume-low cost' and getting increasingly commoditized. The other product categories where nanotechnology is already commercial are small volume-high value products like cosmetics and semiconductors where high cost nanomaterials are viable.

Therefore, simpler low cost methods of production like precipitation and dispersion are imperative for coatings applications. In –house production of nanomaterials by the paintmakers is possible and viable, similar to the production of other intermediates like intermediates, resins and colorants.

- Hype: There is great deal of hype around nanotechnology such that it is implicitly considered to be a preserve of big companies and multinationals. The truth is that research in nanomaterials and their application in coatings is well within the reach of SME companies.
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