

What strategy can be adopted to accelerate application of nanotechnology in coatings?

The first step, as said above, is the acquisition of deep knowledge of nanoscience as it continues to evolve. The linkages with other disciplines will have to be well understood. The study should also cover the existing and emerging applications of nano concepts in other industries like plastics, textiles, cosmetics, semiconductors, photovoltaics etc.

When the capability of nanotechnology is well understood as a platform for new developments, the strategy for R&D will begin to unfold itself. This is a new science where the fundamental cause-effect relationships are yet to be established and hence 'empirical methods' of research are more relevant. These methods rely on practical observation emanating from large volume of experimentation where statistical DOE and combinatorial chemistry can play an important role.

The project portfolio for in-house R&D can include diverse areas as given below. Each of these areas is full of potential for achieving a breakthrough:

- Evaluation of vendor supplied nano-materials
- Dispersions of minerals to nano-scale and their evaluation
- Colorants with nano-scale pigment dispersions
- Co-dispersion of different minerals to nano-scale.
- Precipitation of nano-particles to develop intermediates
- Generation of nano phase during resin synthesis using precursors
- Resin-inorganic hybrids
- Two component systems that generate nano-phase in-situ at the point of use.
- Nano-size polymer emulsions
- Nano-size non-aqueous dispersions (NAD)
- Low temperature cure sol-gel coatings
- Low temperature cure catalyst or cross linkers

The above list is just a sampling and the researchers are sure to come up with many more imaginative propositions.
