



AkzoNobel

Tomorrow's Answers Today

Criteria for 2010 AkzoNobel Science Award

The 2010 AkzoNobel Science Award will be presented to an individual who has accomplished significant advances in one or more of the following fields of science, and his/her findings should have proven, or show promise in leading to significant sustainable, societal and/or user benefits.

1. Materials Science

- understanding of the micro- and nano-structures of materials which determine their morphological, mechanical, thermal, electronic, optical and transport properties.
- the design, creation and processing of complex fluids and 'soft' solids derived from an understanding of the colloid science, rheology and molecular associations of the systems involved.

2. Synthesis

Guided by the principles and practices of sustainable synthesis which seek to maximize the eco- and atom-efficiency of chemical transformation processes; minimize the use of raw materials, particularly those which are finite and not renewable; maximize the selectivity and yields of chemical reactions and minimize the production of waste products:

- the design and development of new routes for the chemical transformation of small organic and inorganic molecules and
- the design and production of functional particles.
- the design and making of functional monomers and their assembly into macromolecular structures by a variety of polymerization methods.
- the modification of the structures and physical properties of synthetic and naturally occurring polymers via chemical and/or biochemical functionalization.
- understanding and control of the composition, architecture, stereochemistry and functionality of macromolecular systems.

3. Process Technology

Guided by the principles of sustainable development and the consideration of diverse factors including safety of production, the environmental impact of processes of production, the security and handling of raw materials and intermediates, costs of production, the integration of unit operations, and the development and adoption of new technologies:

- the adaptation of chemical transformations and their translation from the laboratory bench-scale into production-scale processes.
- the development and scaling of viable routes and the development and optimization of unit operations such as mixing, dispersion, emulsification, separation, purification as well as methods for modelling and controlling unit operations and overall processes.

4. Measurement & Analytical Science

Developments in the use of physical, chemical, and biological techniques and methods to characterize and understand the composition, structure and performance of materials, chemical products and processes, including:

- the elucidation of the composition and structures of small molecules, polymers, particles, complex mixtures and formulated products.
- the analysis of the composition, structure and morphology of surfaces and the interfaces between coatings and substrates.
- the characterization of the bulk properties of materials and
- the in-line and at-line monitoring of chemical processes.