Plenary Session, Invited Lecture

Green Process Development @ BASF: A Short Walk through the Basic and Specialty Chemicals Landscape

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Chemical industry faces an environment with huge challenges – 9 bio people will share the limited ressources of one earth in 2050 – but also of huge opportunities. Innovations based on chemistry will be enablers for covering energy demands, accessing clean water, managing ressources, providing food and nutrition and improving the quality of life. Innovations must be “green” in chemistry and engineering to protect environment and people. BASF as a leading chemical company is creating chemistry for a sustainable future, as our walk trough research activities, past and current achievements will show.

RD activities encompass the innovation of new products, materials and systems of large or small volumes, and the development of new manufacturing processes. Moreover, technology and process innovations are key to remain competitive in the basic and intermediate chemicals industry. Developing a new 100kt process is a different playground then developing a fine-chemical process, skills and methods by much differ. Not surprising, implementation of green chemistry and green engineering principles (cf [1], [2]) reflects those differences, as it will be crystallized by some examples.

Representative for large volume products, the HPPO (propylene oxide by hydrogen peroxide) process, winning the 2010 presidential green chemistry award in the US, as well as the new BASF process to cyclododecanone using N2O, will be presented. Moreover, a more specialized chemical in the mid-volume range (1000to) is demonstrating the typical achievements from systematically applying green principles during process development. The scene in fine chemicals has its different challenges – manufacturing cost is less important than time to market – and living green chemistry and engineering are only possible by high integration and parallelity of product development and process engineering, as it will be argued.

The presentation also refers to industrially applied methods in process development, as well as some industrial expectations.