Session III: Process Intensification

Process intensification

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Entrepreneur

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Abstract:

The chemical process industry (CPI) is capital intensive and requires large amounts of energy and process water. The Indian chemical process industry is not only facing stiff competition from overseas manufacturers but also with Indian software industry, who needs less capital investment and utilities and theoretically has a zero gestation period. This has resulted in a slow growth rate for Indian chemical process industries.

The solution to these problems lies in order of magnitude smaller plants that consume less energy and use sustainable processes. This advocates the need for Process Intensification (PI), an entirely new discipline which has widely grown recently. PI is a strategy for making dramatic reduction in a chemical plant so as to reach a given production objective, or in simpler terms it is the tool to achieve economical feasibility.

There are several idea driven methodologies in process intensification. Some of these are (a) processes which employ multifunctional equipment which reduces capital investment (b) process intensifying equipments such as venturi loop reactor, static mixer, micro reactor etc. (c) use of alternate energy sources and greener processes.

The presentation gives some of these methodologies to increase the competitiveness in production of dyes and pigments and their intermediates. These include improvements in the existing plants for increase in production capacity, development of new technology and combining two or more operations to reduce investment. The presentation covers nitration, oxidation, chlorination, Hoffman's degradation (anthranilic acid production), diazotization and coupling.