A Successful Route from Lab-Scale to Industrial Plant – The Right Priorities from the Beginning

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New processes or innovative reaction mechanisms are reason for joy. However, lab-scale results have to be implemented in commercial plants for industrial application. Innovative companies can avoid unpleasant surprises during scale-up by considering engineering aspects already during the early stage of process development. Thereby, needless project delays or cost explosions can be obviated and the process can be optimized.

Essential basic fundamentals for scale-up can be created by focusing a strong interdisciplinary collaboration between chemists and process engineers during lab-scale process development.

The experimental procedure should be designed in such a manner that next to process validation all required process parameter and data on chemical media are measured which are required for plant design. Within a feasibility study the requirements of the different unit operations and the applicability of standard equipment should be analyzed. Several further topics as for example safety aspects, material selection and availability of appropriate process analysis should be considered. The results of a feasibility study can be used for a first cost estimation to analyze the economy and to identify cost driver. All these findings can be integrated in the lab-scale process development and support to identify the best way from lab-scale to a successful industrial application.

In the presentation, the potential of process engineering support during lab-scale process development is discussed on the basis of golden rules which are illustrated by examples and experience from several projects.