SPECIAL FEATURE SECTION: NEW TECHNOLOGIES IN PROCESS RESEARCH

Editorial

This is the first (and hopefully not the last) special feature section that deals with new technologies in process research. Many manuscripts were submitted for this issue, and I am grateful to all the authors for taking time to describe their work. The contributions describe the use of various types of new techniques, novel instrumentation, or new industrially useful catalysts and give a good overview of the growing interest in developing new technologies to improve process development and, in the long run, develop more robust manufacturing processes.

There are several reasons for the increased interest in new technologies within the process development community. The use of high-throughput experimentation in combination with statistical design of experimentation has been triggered by the need to gather more reliable data within shorter time frames as the pharmaceutical industry experiences rising pressures to shorten the time to market without compromising the quality of data obtained in these shortened timelines.

For various reasons, the number of successful submissions to the FDA has decreased steadily over the last 10 years while the research spending over the same period has gone up approximately 2.5-fold. The FDA has acknowledged this downward trend and has initiated collaboration with the industry to encourage the use of new technologies to reduce cycle-time of the development of a process while maintaining high-quality standards during development and manufacture of drug substance.

At the forefront of novel technologies, there has been an increased use of microreactors as tools for chemical development and, in the long run, manufacture. This engineering innovation has been triggered by the potentials of cost benefit and time savings in "numbering up" instead of critical scaling-up for different types of chemical reactions. The use of microreactors and static mixers also has been proven in several cases to be beneficial for the selectivity of different reactions due to the superior mixing with this technology.

New, more active homogeneous and heterogeneous catalysts have gained an increasing interest due to the demands for greener chemistry and the increased chemo- and stereoselectivity such catalysts afford.

Continuous microwave reactors are gaining increased popularity in the pharmaceutical industry as they open new avenues into accelerating reaction kinetics, enabling novel transformations, and when used in continuous-production mode, improving reaction throughput.

Finally, this special issue would not have been possible without the hard work and support of Sue Parsons and Trevor Laird. I thank them for their contributions and constant support.

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OP049928S

10.1021/op049928s CCC: $27.50
Published on Web 04/21/2004