

# Organic Process Research & Development

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## *Editorial*

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### Design of Experiments (DoE)

Why are organic chemists, when compared to other chemists (e.g. analytical chemists) or other scientists and engineers so reluctant to use “design of experiments” techniques such as factorial designs and response surface analysis? Is it partly due to the lack of DoE training that is given in chemistry courses? (I know that one or two schools of chemistry, particularly in Scandinavian countries, do provide DoE training as part of chemistry or associated statistics courses, but they are very much a minority.)

It is my view that these methodologies should be an integral part of all undergraduate or postgraduate training, since they help with understanding the choices of experiments to carry out and the meaning of the results and with expanding the knowledge of where true optimum conditions lie or even what “optimisation” means. Too many students are taught that “changing one variable at a time” is the best method of optimisation, whereas industrial chemists—and particularly process chemists—know that parameters are rarely independent of each other.

The methodologies are useful in other areas of chemistry, too. For example, in discovery research, where structure–activity relationships are examined, or in analytical chemistry, where analytical methods need to be optimised. In the latter area, the DoE methodology is often incorporated into the instrument software these days.

To make progress in the education of organic chemists in this field, we must first persuade academic professors who design the teaching courses for undergraduates that DoE methodologies are not only useful but also essential for the understanding of experimental results, as well as for optimising experimental productivity.

Although the readership of this journal is mainly industrial, I hope the academic readers will take my comments to heart and will contact me—I will be only too willing to help with training in this area. For the industrial readers, I expect you to raise these issues with your academic collaborators. Good Luck!

I have had some correspondence concerning the editorial last month in *Organic Process Research & Development* on M&A. It was not intended to be comprehensive so my apologies to any merged or acquired companies who did not get a mention.

Trevor Laird

*Editor*

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