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Special Feature Section: Safety of Chemical Processes Safety Feature

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Special Feature Section on Safety of Chemical Processes

Organic Process Research and Development (OPR&D) has been publishing these special feature sections on the Safety of Chemical Processes since 2002. In my first editorial, I commented on the need to acquire knowledge about the safety of processes, particularly when operating on kilogram or tonne scale.

The knowledge gained by an expert safety evaluation leads to a better understanding of the chemical process, which often results in a better process, often with cost savings, and is therefore an essential part of the development process. However, knowledge of hazards is not enough to prevent accidents. The management systems must also be in place; I quote Trevor Kletz,¹ "It might seem to an outsider that industrial accidents occur because we do not know how to prevent them. In fact they occur because we do not *USE* the knowledge that is available. Organisations do not learn from the past or rather, individuals learn but leave the organisations, taking their knowledge with them, and the organization, as a whole, forgets."²

So where are we now in 2013? Have we learned so much more in 11 years? I think that individuals have more knowledge of potential safety issues, but I am sure that many companies have still not learned the lessons from the accidents and incidents of others. Too many companies still scale up processes with very little information on the kinetics, the thermochemistry, and the gas evolution in the process and fail to do even the most basic calorimetric experiments, even with compounds and reagents which look potentially hazardous on paper. The trend over the past decade of more and more outsourcing, with less and less time to do detailed development to gain process understanding, means that vital safety studies may be omitted in the race to deliver product on time.

A quick Google search reveals many chemical incidents in 2013, not all due to reactive chemical hazards, but most seem to be due to a lack of knowledge or poor management practices. In the past decade there have also been a few high-profile chemical incidents in university laboratories, when the lack of knowledge, inadequate training, or poor safety culture has resulted in loss of life. There is a long way to go to educate and train to a high standard all chemists working in laboratories and chemical plants and to minimize the number of these incidents, which lead to damage to buildings and loss of profits, as well as loss of life. Companies always measure the cost of doing something (e.g., training) but never measure the cost of not doing something; there is a cost of not training staff, however, just as there is a cost associated with not complying with regulations (e.g., FDA regulations). Safety training for all staff, in my view, is always cost-effective.

By publishing our annual safety review and a selection of case studies each year, we are building up a database of potentially hazardous processes, with information leading to understanding of the process; understanding always leads to better control and possible prevention of runaway or serious incidents.

I would like to thank all the contributors to this special feature section for their commitment to publishing in this

important field and their companies/organisations for allowing the authors to publish.

I also encourage readers to think now about preparing to submit a paper for the 2014 special feature section on Safety of Chemical Processes, which will, as usual, be in the last issue of 2014. Ideally, papers need to be received by the middle of 2014 to allow enough time for publication in this issue.

Trevor Laird, Editor

AUTHOR INFORMATION

Notes

Views expressed in this editorial are those of the author and not necessarily the views of the ACS.

REFERENCES

- (1) Sadly, Trevor Kletz passed away in November at the age of 91. He was a great man and will be remembered for his fine work in the area of process safety and for his many books.
- (2) Laird, T. *Org. Process Res. Dev.* **2002**, 6, 876.

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