

Editorial

What Is *OPRD*'s Responsibility toward Safe Chemistry?

Recently, we received a manuscript that described kilo-lab-scale chemistry conducted at 100 °C without solvent and open to the atmosphere. Further inquiry revealed that no prior investigation of possible thermal events had been conducted beyond running the reaction many times in the lab, possibly at escalating scale, and observing no measurable heat generation. We found this disturbing on several levels, (1) that no ARC, DSC, ARSST, or calorimetric work had been done on the reaction with or without possible impurities (e.g., iron) that can catalyze decompositions and (2) that the institution submitting the paper did not possess resources to adequately examine potentially dangerous chemistry nor have procedures in place to do so.

I decided to proceed with the review process and allow the reviewers to forward their decisions as well, in case I was being too strict. Nevertheless, I think this occurrence serves to highlight a few useful observations.

First of all, the fact that a reaction was conducted without incident numerous times at the bench is not confirmation of its safety, obvious as this may sound. Many a young graduate student has scaled up a Grignard formation that could be adequately cooled when conducted at 100-mL scale but was unpleasantly surprised to discover that the exotherm could not be controlled at 1 L. This used to be a bigger problem when we still used ether as a Grignard solvent, but even the boiling point of THF can be exceeded quickly by a vigorous Grignard reaction. The unyielding dictum of the inverse square law (surface area does not increase as fast as volume when a spherical object is scaled up) can be bitterly learned in such circumstances.

Second is that, in spite of all the safety precautions and resources that exist, it is still possible for things to go disastrously wrong. Both in the university and in industry, recent events have underscored such unfortunate outcomes. This is the reason any large-scale work should undergo 'what if'

brainstorming exercises, exploring every possible contingency or combination of possible events to see if the consequences would be significant, thus prescribing that additional precautions are mandated.

Finally, what is *OPRD*'s responsibility toward safe conduct in laboratories and plants? We already sponsor a special feature section on safety each year (the November/December issue) where articles with a significant safety theme are included. In 2003, along with the feature on safety, we initiated a report wherein safety issues are highlighted (Safety Notables: Information from the Literature [DOI's: 10.1021/op034143s; 10.1021/op049820c; 10.1021/op050192o; 10.1021/op060198t; 10.1021/op700220w; 10.1021/op800241n; 10.1021/op900254g]), and I think we can claim that the process chemistry we publish embodies safety as a significant aspect.

As part of the editorial mandate that you have granted us for *OPRD*, we reserve the right to refuse manuscripts where we believe the process is unsafe as described or to demand further elaboration of potentially unsafe circumstances. There is a certain basic level of safety acumen that we expect our readers and contributors to possess as experienced scientists and engineers, but chemicals, operations, or procedures that hold the possibility to surprise must be planned and conducted in a proper manner and emphasized as such in the text. Therefore, for any future submissions to *OPRD*, we expect safety to be an integral part of the manuscript and that this testing be mentioned or discussed in the body of the manuscript if there is a good reason to do so.

Please be safe and look out for each other, in the lab, the office, and the plant. We need all of our readers.

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OP1001098