Organic Process Research & Development

Editorial

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I'm C.O.N.F.U.S.E.D.

The other day I was reading a reviewer's comments on a paper in which he commented that he had not come across the abbreviation FED, which in the United Kingdom (UK) means factorial experimental design and is used in many companies in place of the more common terminology DOE, design of experiments, which tends to be used in the United States (US). Of course, DOE is a common abbreviation used in other walks of life, as is FED, and a quick Google search found 44 different meanings of DOE (some of which you would guess such as Department of Energy, ...Environment, etc.), whereas FED only produced 40 different acronyms. Surprisingly, none of the ones listed included Factorial Experimental Design, but ones listed which you would not have guessed were Fish-Eye Disease and Flotilla Enrollment Date!

A few months ago, when I was in court doing expert witness work for a chemical company, I heard the lawyer talking about the C of A in a context where it could not possibly have had had its normal meaning for a chemist, namely, Certificate of Analysis. Eventually I realised he was referring to the Court of Appeal. Then later, during lunch, he was referring to QBD, and I knew I was missing something; there was no way he could have been referring to Quality by Design, used by chemists. It puzzled me for hours, and in the end I gave up and had to ask him what QBD meant—apparently it is a legal abbreviation for Queen's Bench Division.

Thus, when writing papers we need to ensure that the reader, who may be of a different nationality or from a different scientific discipline, understands the meaning that you give to an abbreviation. This is particularly important for multidisciplinary journals such as *Org. Process Res. Dev.* (OPRD) (Google lists 4 other meanings of OPRD including Obsolete Property Rehabilitation Department!!!) where the meanings of terms and abbreviations may be different for chemists as opposed to, say, those for chemical engineers.

Large companies are very good at developing their own in-house jargon and abbreviations which may not be used elsewhere. For example, when I joined Imperial Chemical Industries (I.C.I.) in the early 1970s, operators on the plant would be referring to the strength of hydrochloric acid not by its percentage HCl, as laboratory chemists would, but by its Twaddell number, which I had never heard of at university, and I suspect many of our readers have similarly never seen the term used in print. However, if you look it up on Wikipedia, you will see that the Twaddell Scale (named after a Scottish Company, W. Twaddell, who made hydrometers) is a scale used to measure specific gravity of liquids compared to that of water, and is still used in many UK and Commonwealth companies particularly in the dyestuffs industry. Yes, you can still buy Twaddell hydrometers, and no, it is not a load of twaddle (definition: nonsense)!

Consequently, my message to authors is this: please make sure your abbreviations and in-house jargon are well-known and, if not, please list the abbreviations with their definitions at the end of the paper. This is common practice in engineering journals where symbols and abbreviations are always compiled to help the reader.

On a similar theme I see some papers still using the word gallons when describing the volume of pilot-plant and production-scale equipment. The confusion arises because, for some reason which goes back a long way, the American gallon[1] is only about four-fifths of the British gallon, namely 3.79 L compared to 4.55 L in the UK. However, these measures are usually used in the OPRD papers only for the vessel size; when you read the experimental, the reagents and solvents are usually charged to the vessel in litres!! This seems a recipe for misunderstanding, and I ask authors when writing papers to convert all their equipment volume measurements into litres to make sure that we all understand exactly what size the vessel is.

In the UK, there is no excuse for using the gallon, since chemical engineers have long since moved to metric units, and a European Union (EU) directive banned the use of the gallon as a primary measure in the 1990s. Nevertheless, the terminology is still around as a secondary measure in wide usage, for example, for fuel measures. Whereas chemists (even those of my age) on both sides of the Atlantic have always been taught at school and college in metric units, chemical engineers in the US may well still be taught in degrees Fahrenheit, US gallons, and British Thermal Units as well as pounds for weight. The traditional (often called Imperial or British) units are still being used in many industrial plants, and with chemists and chemical engineers using different units, scale up can be potentially problematic, with temperature units particularly being a recipe for confusion. The last chemical engineering course I attended in the US (OK, it was a long time ago) was entirely in these archaic units, and it certainly left me confused.

So please, please me (as the Beatles[2] once sang) and stick to metric units for OPRD publications. If you must use the old Imperial units, save it for the pub. Next time I see you, remember, mine's a pint, but only if it is a British Pint! Or a wee dram if you care to buy me a single malt!

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) I was surprised to find out that in the US there is still the liquid gallon and the dry gallon which are different amounts! Even more confusing!

(2) In commemoration of 50 years since the Beatles' first hit in 1962.

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