Football crazy, fullerene mad

As the beautiful game once again takes to the world stage this summer, it is worth remembering that 2010 also marks the twenty-fifth anniversary of the professional debut of a very tiny football.

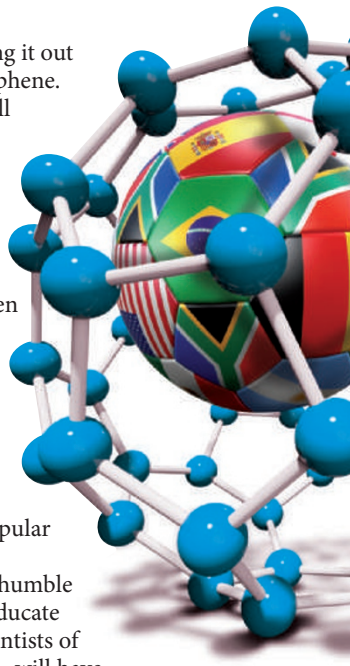
There are very few scientific papers with shorter titles than the two words that announced experimental evidence for the formation of a special cluster of carbon atoms. But 'C_{60}: Buckminsterfullerene' says all it needs to[1]. And there are probably not too many other Letters to *Nature* that feature a photograph of a football (on Texas grass no less). Including this image was a masterstroke, however, because it gives the reader a simple and instant connection to the science — after all, it's surely much easier for most people to compare the structure of C_{60} with a football rather than a truncated icosahedron.

So, 25 years on, what impact has C_{60} had? At a fundamental level, this unique carbon allotrope has provided the inspiration for a vast number of research projects. Moreover, the fullerene family itself has grown as other examples — such as rugby-ball-shaped C_{70} — have been discovered. As well as looking at the properties of the pristine fullerenes, chemists just can't help themselves and have sought to tinker with their structures in many different ways. The hollow interiors of these molecules are instantly appealing in terms of trying to squeeze other atoms inside, and the outer surface of fullerene cages has a rich chemistry that can be exploited to make a wide range of derivatives.

From all this academic research, however, there are very few examples that have leapt out of the laboratory and into the commercial sector. Although the electron-accepting properties of C_{60} and its derivatives make them potentially useful components in bulk-heterojunction solar cells[2] and endohedral metal fullerenes show promise as medical contrast agents[3], 'real-world' applications of these compounds are few and far between. Nonetheless, the discovery of fullerenes was recognized with the award of the 1996 Nobel Prize in Chemistry, a nod towards the more fundamental — rather than obviously practical — aspects of science.

Arguably the greatest contribution that the little carbon sphere has made over the past 25 years is not in what it actually does itself, but what it has inspired others to do. Pictures of words drawn with atoms, and Feynman's vision notwithstanding, fullerenes played their part in turning chemists towards the ideas and goals of nanotechnology. Not only that, but fullerenes offered a conceptual blueprint for some of the most widely studied nanomaterials today — extending a fullerene in a single dimension produces a carbon nanotube; cutting a nanotube open along its length and flattening it out gives a sheet of graphene.

Of course, not all nanotechnology is carbon-based, but these materials have hogged the limelight somewhat, and their structures often grace the front covers of books on the subject — and C_{60} is undoubtedly one of chemistry's iconic images. More importantly, if its bridge into popular culture through its similarity with the humble football serves to educate and inspire the scientists of tomorrow[4], then C_{60} will have served a very important function. ❐



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All a-Twitter about chemistry

Twitter is more than just the place to go to find out what celebrities have had for breakfast — if you look hard enough, it can be a useful source of chemistry news, highlights and debate.

With the rise in popularity of the social networking/microblogging site Twitter, there is now another channel by which journals can disseminate their content. Twitter enables users to post 140-character snippets of information — known as Tweets — on their profile page. It is also possible to 'follow' the Tweets of other users, and these are aggregated in a feed that can be viewed through various web- or desktop-based clients. *Nature Chemistry* is on Twitter[1] and not only do we use it to let our followers know about the content we've published, but we also Tweet from conferences (when the rules allow), and share chemistry-related news that the editorial team find interesting. It also provides a means by which we can actively engage with our followers, by responding to Tweets addressed to the journal.

It is understandable that the emergence of yet another social-networking tool prompts scepticism[2] and worries of information overload — and the signal-to-noise ratio in Twitter can be a cause for concern. Nevertheless, carefully selecting who to follow and establishing lists — such as the one we've compiled[3] that draws together chemistry journals we've found on Twitter — means this problem can be managed. Only time will tell whether Twitter catches on as a way of keeping up with the scientific literature[4], but for now, @NatureChemistry is going along for the ride! ❐

References

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