

## Farewell to Dr Kaise

Late November 2009, our friend and colleague Professor Toshikazu Kaise passed away after a fight against illness. Kaise (to his friends he was always Kaise) published over 100 papers in the general area of environmental toxicology with a focus on arsenic biotransformation in both the marine and terrestrial environment. Kaise's early pioneering studies on the biodegradation and metabolism of arsenic species by marine bacteria constituted seminal work in the area of environmental arsenic chemistry.

Kaise was not only an outstanding scientist, but also an excellent teacher. He always sat at the front during scientific meetings and frequently gave critical, but helpful comments to students and young scientists. Kaise's enthusiasm for science was infectious and he was able to excite students about his research. He penned, together with Professor Kurt Irgolic, 'The Arsenic Song' (almost an arsenic symposium anthem), and coined the term 'Arsenology – the study of arsenic in toxicology'. Arsenology, as defined by Kaise was 'the response of biota to the different molecular forms of arsenic'. This reflected his passion for his research topic and how important the field of arsenic speciation in toxicology was to him.

Kaise had an extraordinarily open and friendly personality, which endeared him to many. He was renowned for his congenial nature and his exceptional musical talent – he often entertained his conference colleagues with virtuoso displays on a variety of musical instruments, including the piano, pipe organ and koto (a traditional Japanese stringed instrument). His impromptu performances were interspersed with short refreshment breaks and loud calls of 'kampai'.

This issue of *Environmental Chemistry* includes a special section comprising six papers on various aspects of arsenic uptake, transformation and environmental toxicity. They are dedicated by the authors to the memory of their special friend Kaise. The papers cover a range of subjects from biodynamic modelling for arsenic bioaccumulation<sup>[1]</sup> to an assessment of the toxicity of arsenic-bearing sulfide minerals.<sup>[2]</sup>

The timing of the publication of this arsenic collection is quite fortuitous because arsenic is once again in the news. Late last year, a multi-author, multi-disciplinary paper reported the discovery of an amazing bacterium that can use arsenic in place of phosphorus for growth.<sup>[3]</sup> Furthermore, the authors produced some evidence indicating that arsenate in the organism was associated with nucleic acids and other important



A final 'kampai' for Professor Kaise.

macromolecules. Exaggerated claims in the popular press of a new life-form quickly followed, but they were dismissed by the scientific community. Additionally, limitations of the original paper were pointed out, which has resulted in an ongoing debate on arsenic's possible involvement in essential biological processes. Were he alive today, Professor Kaise would have certainly made a spirited contribution to these scientific discussions.

William Maher, Guest Editor

- [1] P. S. Rainbow, B. D. Smith, M. C. Casado-Martinez, Biodynamic modelling of the bioaccumulation of arsenic by the polychaete *Nereis diversicolor*. *Environ. Chem.* **2011**, 8, 1. doi:10.1071/EN10089
- [2] L. Cui, C. Newcombe, D. S. Urgast, A. Raab, E. M. Krupp, J. Feldmann, Assessing the toxicity of arsenic-bearing sulfide minerals with the bio-indicator *Corophium volutator*. *Environ. Chem.* **2011**, 8, 52. doi:10.1071/EN10044
- [3] F. Wolfe-Simon, J. S. Blum, T. R. Kulp, G. W. Gordon, S. E. Hoefft, J. Pett-Ridge, J. F. Stolz, S. M. Webb, P. K. Weber, P. C. W. Davies, A. D. Anbar, R. S. Oremland, A bacterium that can grow by using arsenic instead of phosphorus. *Science* [Published online ahead of print 2 December 2010]. doi:10.1126/SCIENCE.1197258