

Johan Roeraade **Joint Winner of the 2007 Chromatographic Society Martin Medal**



Johan Roeraade, Head of the Analytical Chemistry Division at the Royal Institute of Technology (Kungliga Tekniska Högskolan, KTH) in Stockholm, has a career-long reputation for high quality, innovative separation science stretching from his early days as one of the leaders in the field of capillary gas chromatography to the past two decades, where he has been a forefront runner in using micro- and nanotechnology for separations and related applications. He was born in 1942 in Amsterdam. After his college education in chemical engineering, he moved to Sweden where he first was at the University of Agriculture, followed by an industrial science position where he worked with the analysis of tobacco flavour. In 1981 he obtained the equivalent of a DSc at the Royal Institute of Technology in Stockholm, and in 1982, he obtained a position as associate professor at the same department where he is at present.

Johan Roeraade has over 150 refereed publications in a very wide range of analytical and other journals and is a much in demand speaker (more than 250 invited or plenary lectures) at major international symposia, such as those in the GC, HPLC and HPCE series, but also in areas like biochemistry, MEMS and process analysis. He has 20 patents. He was the co-initiator of the Hindelang (now Riva del Garda) symposium series in 1975, where Rudolph Kaiser was the primus motor. He was one of the co-founders of the Journal of High Resolution Chromatography (now the Journal of Separation Science), and he has an extensive record as organiser or scientific committee member for symposia as well as editorial board member for journals in separation science.

His research output in capillary GC includes the development of high resolution micropreparative separations of flavour components in quantities, sufficient for NMR, and he described several new methods for trace enrichment, such as chromatographic evaporation in a continuous mode for quantitative concentration of volatiles in extracts and for headspace trapping, the thick film trap concept, and a combination of FIA and GC for automated analysis of organic trace components in water. He was the first to demonstrate large volume injection (50 μ l) on an empty pre-column. He showed extended possibilities of the empty pre-column (retention gap) concept by using an independent temperature programme, as well a liquid backflush. He is the originator of the at-column technology. Recently, he reported on a novel sample introduction technology (the electro-injector) which solves the more than 30 year old problem of solute discrimination.

He became interested in miniaturisation at an early stage. His first attempt to make a silicon chip-based flow splitter was reported at the 1980 PittCon. As he became interested in capillary electrophoresis, he demonstrated the usefulness of microchips in the late eighties and he also began to develop his work in nanotechnology. In the field of miniaturisation he has gone way beyond being one of the many advocates of it as being the way forward for separation science to being someone who has been publishing on the actual practice in the area for about two decades. He was awarded with the Norblad Ekstrand Gold Medal from the Swedish Chemical Society for his pioneering work in miniaturisation of chemistry. His output in microfluidics/lab-on-a-chip covers many aspects and novel ideas, such as nano- and picoliter vials for both chemical reactions and MALDI mass spectrometry, a liquid lid to prevent solvent evaporation, a new fabrication technology for glass chips, fabrication of silica nanowires, and separation in sub-micron channels. Also, he has published several articles on DNA analysis with a new detector concept, based on a liquid-core light guide principle, as well as a segmented flow injection system for continuous PCR.

In mass spectrometry, he has developed new matrices for laser desorption ionisation of small molecules (PALDI), new nano-electrospray devices, and picolitre droplet handling technology for ultrasensitive MALDI-MS as well as microchip-array chemistry.

Last but not least, he is known for his enthusiasm for his subject and is characterised by a good sense for the history of his subject, for example in 2001 having penned the book chapter "From Crushed Bricks to Microchips". On a personal note, Johan is a great lover of wine, being a cofounder of the SWAG (Separation Wine Appreciation Group) with Peter Myers!