Juhani Murto

* 9/5/1935 † 8/1/2016

ASSOCIATE PROFESSOR Taavi Juhani Murto, who died on 8th January 2016 after a protracted illness, was born in Viipuri on 9th May 1935. He was married to Maija-Leena Murto (née Lappi), and they had two sons, Antti and Janne. Having matriculated from the Karelia Coeducational School in Lappeenranta in 1954, he began his studies at the University of Helsinki the following year, choosing chemistry as his main subject and exceptionally laying foundations for his future academic career by extending his studies to physics and mathematics as well.

Juhani Murto gained his doctorate in 1962 with a thesis entitled *Alkoxide equilibria and kinetics of alkaline solvolyses of methyl iodide and some aromatic nitro compounds in mixed hydrolytic solvents*. The work earned him the highest possible grade. His supervisor had been Professor Eero Tommila and the work was highly topical at that time and focussed on the solvent effects on the rates of chemical reactions. Murto demonstrated that a chemical reaction could be speeded up by several orders of magnitude by altering the solvent conditions. He received the Anders Donner, Edvard Hjelt and Gustav Komppa prizes for this work and was appointed associate professor of physical chemistry at the University of Helsinki in 1967, a position which he held until 1989. He was invited to membership of the Finnish Academy of Science and Letters in 1973.

Murto was a precise, intelligent and open-minded but modest scientist and teacher, never tired of looking for new approaches. He followed developments in his field, which led him to take a sabbatical leave at the University of Swansea, where he adopted a new research method, in which a chemical compound could be isolated into an inert gas matrix at only a few degrees above absolute zero. He then introduced this method in Finland and used it to study the properties of individual molecules, molecular interactions and photo- chemical reactions. Since then it has since been used to examine a number of molecular complexes, weakly bound molecular aggregates and chemical reactions of inert gases.

To examine so prepared isolated molecules Murto chose to use spectroscopic methods, which also called for a revision of the teaching traditionally provided in physical chemistry. Tools from quantum mechanics were required in order to un-

derstand the spectra, and instruction was needed in experimental molecular spectroscopy methods as well. Murto played a major role in starting teaching in these internationally developing fields of physical chemistry in Finland.

As was his style of doing things, he produced a series of clear, faultless lecture notes as a basis for his teaching, and these have remained in use from one year to the next in other Finnish universities as well.

The introduction of quantum mechanics and spectroscopy into research and teaching automatically led also to the need to use computers in the context of both computational chemistry and digital spectral data analysis. Thus Murto became one of the first people in Finland to make use of quantitative chemistry programs, and at the same time one of the first large-scale users of "supercomputers" of the time.

Murto was ahead of his time in Finland but on the nerve of international developments in his field, so that he was able to make a significant contribution to the updating of Finnish research in physical chemistry and to inspire many students to take an interest in this field.

Murto also put a lot of effort into the supervision of postgraduate students. He would give the doctoral students a good deal of freedom and responsibility, but was ready to help them at the most important parts of the Thesis work, in planning the experiments and at writing stages. In spite of his precise and demanding attitude, he was always warm and friendly and not without a sense of humour.

One speciality of his style of lecturing was his efficient use of the blackboard. As he spoke he would record everything that he said on the black board in upper case handwriting with his right hand and rub it out again a few seconds later with his left hand. This forced the students to concentrate hard during his lectures and guaranteed excellent results in terms of learning.

Although this method must inevitably had a selective effect on the nature of his audience, it can certainly be said that Murto exercised a crucial modernizing influence on the teaching of physical chemistry in Finland, and it is undeniably the case that the branches of the subject that he introduced has gained strong interest and now constitute the backbone of physical chemistry in this country. The postgraduate students that he taught and the postgraduates that they in turn taught have included eight professors to date, all of whom have made abundant use of the methods of spectroscopy and computational chemistry in their research.

It is largely as a result of Murto's work that Finnish research in physical chemistry has expanded significantly and boosted international contacts. Internationally competitive research is done today in several subfields of physical chemistry: in low-temperature chemistry, the chemistry of inert gases, high-resolution spectroscopy, ultrafast chemistry, biomolecular chemistry, nanosciences, surface chemistry and computational chemistry. The work that he initiated covers an extremely wide variety of contemporary topics in chemistry ranging from nanotechnology to marine research.

The most important thing of all, however, is that he retained his interest in the directions and applications of international chemical research until the very end and would readily discuss these things

and follow new developments carefully. Researchers that he has trained are now to be found in departments of theoretical and applied chemistry at numerous universities and research institutes.

Juhani Murto spent much of his spare time doing forestry work at his cottage in Taipalsaari. He was also keen on studying languages and read a large amount of Russian literature.

Obituary by
Markku Räsänen,
Jouko Korppi-Tommola
and Matti Perttilä