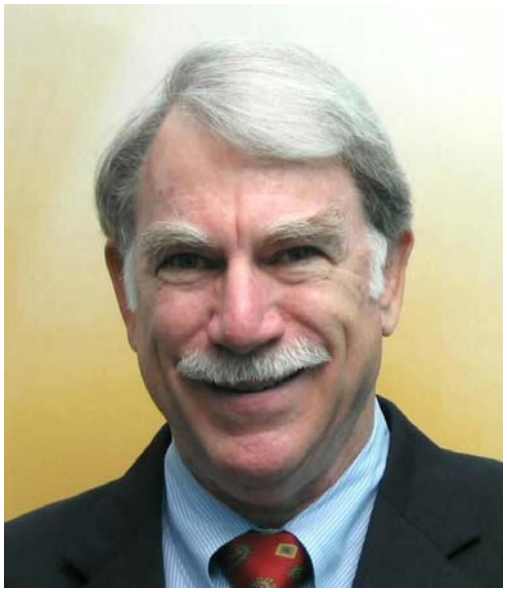
Biography



Alan G. Marshall was born in Bluffton, Ohio in 1944, and grew up through high school in San Diego. He entered the then-new six-year medical program at Northwestern University in 1961, persisted through the first year of medical school, and then left to complete his B.A. degree with Honors in Chemistry in 1965. He completed his Ph.D. in Physical Chemistry from Stanford University in 1970, working with John Baldeschwieler on both NMR and ICR projects. He joined the Chemistry faculty at the University of British Columbia (Vancouver, Canada) in 1969. While in Canada, Alan was ace hitter for the 1978 Canadian Men's Open Volleyball National Champion team. He moved to Ohio State University in 1980 as Professor of Chemistry and Biochemistry and Director of the Campus Chemical Instrument Center. In 1993, he moved to Florida State University, where he is Robert O. Lawton Professor of Chemistry and Director of the Ion Cyclotron Resonance Program, supported by NSF as a national user facility. Although he has published extensively in several areas of spectroscopy, he is best known for his co-invention and continuing leading development of Fourier transform ion cyclotron resonance (FT-ICR) mass spectrometry. His major recognitions include: Fellow of American Physical Society, Fellow of American Association for the Advancement of Science, Fellow of the Society for Applied Spectroscopy; three American Chemical Society national awards (Chemical Instrumentation, Field-Franklin Award, and Analytical Chemistry Award); two Spectroscopy Society of Pittsburgh Awards (Hasler Award and Spectroscopy Award); the American Society for Mass Spectrometry Distinguished Contribution Award; the International Society for Mass Spectrometry Thomson Medal; and the Chemical Pioneer Award from American Institute of Chemists. He is a former President of the American Society for Mass Spectrometry, and serves on several editorial boards. He has published four books, four patents, and 450 refereed journal articles, and has presented 1,400 talks/posters at conferences, universities, government labs, and industry. His papers have been cited 16,000 times. Of his 103 former Ph.D.'s and postdocs, 29 have gone on to academic positions. His current reseach spans FT-ICR instrumentation development, fossil fuels and environmental analysis, and mapping the primary and higher-order structures of biological macromolecules and their complexes.

Abstract

Reading Chemical "Fine Print":The Quiet Revolution of Ultrahigh-Resolution Mass Spectrometry

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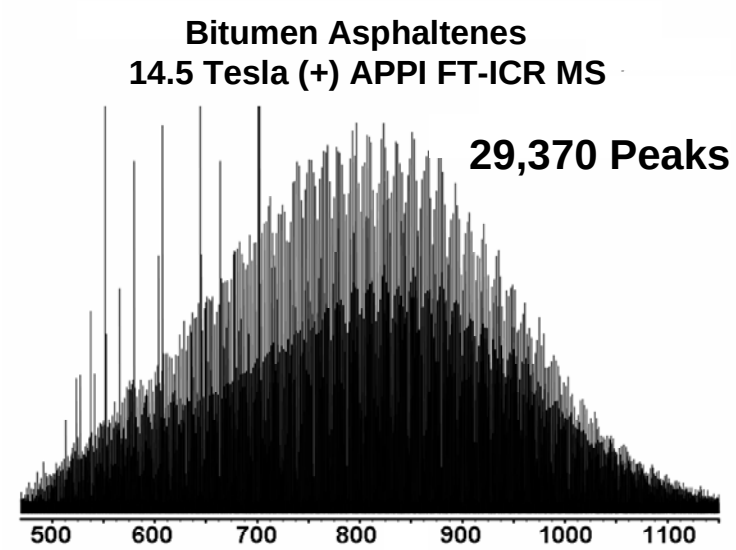
Every molecule has mass: thus, a mass spectrum is potentially a universal detector. Ultrahigh-resolution broadband mass resolving power ($m/\Delta m_{50\%}$ > 400,000, available only with Fourier transform ion cyclotron resonance) has two important advantages. First, it becomes possible to separate complex mixtures (see Figure) without prior chromatographic or gel separation. Second, elemental composition, $C_cH_hN_nO_oS_s$…, may be determined from accurate (to better than 1 ppm) mass measurement alone for unknown molecules up to ~1,000 Da. At higher mass, biomacromolecular primary and higher-order structures become accessible. Examples from environmental, petrochemical, analytical, and biological (especially proteomics) problems will be presented. Supported by NSF (DMR-00-84173), NIH (GM-78359), Florida State University, and the National High Magnetic Field Laboratory.



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