Many of the properties that vaulted inductively coupled plasmas to supremacy for preparing sample material in light spectroscopy also were found to make them desirable as an ion source for mass spectroscopy. In *inductively coupled plasma mass spectroscopy,* only the desired ions of sample material in the plasma are "sucked out" or extracted into the vacuum of a mass spectrometer. There, the elements and isotopes present are identified and their abundance is measured.

Initially funded by the Environmental Protection Agency but supported by Basic Energy Sciences for the last 6 years, the research at Ames Laboratory found a solution to a longstanding problem in mass spectroscopy. With precise control of the ions from the plasma, chemists could dramatically reduce the introduction of undesired impurities into the super-sensitive mass spectrometer. Chemists now could measure both elemental content and isotopic abundance, from liquid or solid samples, without inserting the bulk sample itself into the high vacuum environs of the mass spectrometer. Plus, they gained an analytical tool for accurate analysis, whether the material being tested was present in the sample materials at trace or major constituent levels.

Currently, there are nine United States vendors of commercial inductively coupled plasma instruments and an estimated six vendors in foreign countries. In recent years, inductively coupled plasma instruments led all other major analytical instruments in percentage growth of sales, amounting to over 20 percent annually.

For 1985, the estimated domestic sales volume totaled $55 million while the world market is estimated at $100 million. Approximately 500 more facilities at universities, government research institutions, and private analytical laboratories, adopt inductively coupled plasma technology each year.

Sales of these instruments are projected to continue to increase at a rapid pace over the next decade. It is estimated that the 2,000 instruments sold during the past 4 years will reduce the costs for chemical analyses by $500 million over the lifetime of the instruments.

Individually, or collectively, the methodologies developed at the Ames Laboratory revolutionized the way trace elemental analysis is performed. They made fast and reliable analysis of mixtures possible, and the inventor and his colleagues transformed the methods from a laboratory curiosity into a practical tool for research and industry. It was appropriate that *Spectrochemica Acta*, the international journal of spectroscopy, dedicated its first special issue honoring an American to Velmer Fassel, the inventor of inductively coupled plasma spectroscopy.