Brazilian Journal of Analytical Chemistry
2023, Volume 10, Issue 38, pp 6-10
doi: 10.30744/brjac.2179-3425.interview.dressler

BrJAC

INTERVIEW

Professor Valderi Dressler, a great admirer of young Brazilian scientists, kindly granted BrJAC an interview

Valderi Luiz Dressler
Full Professor in the Department of Chemistry at the Federal University of Santa Maria, RS, Brazil

Valderi Luiz Dressler holds a chemistry degree (1992) and a master's in chemistry (1994) from the Federal University of Santa Maria (UFSM), RS, Brazil, a PhD in chemistry (1999) from the Federal University of Santa Catarina, SC, Brazil and post-doctorates from Forschungszentrum Julich GmbH, Germany (2007 and 2010). Currently, he is a full professor and coordinator of the industrial chemistry and bachelor's chemistry degree courses at the UFSM.
Dr. Dressler's research activities mainly include trace analysis and environmental chemistry, involving the techniques of atomic absorption spectrometry (AAS), inductively coupled plasma optical emission spectrometry (ICP-OES), inductively coupled plasma mass spectrometry (ICP-MS), flow injection analysis (FIA), electrothermal vaporization (ETV) and laser ablation (LA). Furthermore, he performs chemical speciation analysis studies involving hyphenated techniques such as liquid and gas chromatography coupled to ICP-MS and also FIA systems coupled to AAS.

What is your birth city? How was your childhood?

I was born in Restinga Seca, a small city located in a rural area in the central region of the state of Rio Grande do Sul, Brazil. My relatives were quite poor small-scale farmers. My father, who died when I was still a child, worked in tobacco farming, while my mother grew rice and corn. I lived there until my first years of university. During my childhood and adolescence, the day was divided between school and work in agriculture, as well as having fun with a large group of friends who I still meet today.

What early influences encouraged you to study chemistry? Did you have any influencers, such as a teacher?

I don't remember any fact or person that influenced me to study chemistry. Perhaps the biggest influence came from my parents, who told me to continue studying and not follow their profession. I have always been very curious to know how "things", like an electric or combustion engine, work. During my basic education in a public school, I did not have activities in chemistry, physics and biology laboratories. Even so, my curiosity was always focused on the science classes.

When did you decide to go to the Chemistry area? What motivated you? How was the beginning of your career in chemistry?

Cite: Professor Valderi Dressler, a great admirer of young Brazilian scientists, kindly granted BrJAC an interview. *Braz. J. Anal. Chem.,* 2023, *10* (38), pp 6-10. https://dx.doi.org/10.30744/brjac.2179-3425.interview.dressler

As I mentioned before, I was always more enthusiastic about the science area. Physics classes interested me a lot, because for me physics was more concrete than chemistry. In the last two years of high school, I had good teachers for both physics and chemistry. When I finished high school, I had to choose among the courses offered by the UFSM, which was the closest university to where I lived. The Industrial Chemistry course caught my attention and it was the course I chose. The beginning of the course was difficult because, besides my previous education having been relatively limited, I had to reconcile classes with work. In the second year of the undergraduate course, I started scientific initiation as a holder of a scholarship from the university and later as a scholarship holder of the Rio Grande do Sul Research Support Foundation (FAPERGS) and the National Council for Scientific and Technological Development (CNPq). During this period everything was new to me. I had more contact with ultraviolet-visible (UV-Vis) spectrometry and AAS, which was at its peak, especially AAS with graphite furnace atomization.

It is also necessary to mention that in this period the chemistry department at the UFSM was hiring new professors, most of them PhD-holders, who implemented the postgraduate course. The research environment was effervescent and I received many incentives from my advisor and colleagues that were very important for my training and professional career. This was a period of much news and learning. At the end of my degree course I started to participate in scientific events, wherein the contact with the scientific community also favored my education. Thus, after graduation, I decided to enter the master's program at the UFSM and then the PhD program at the Federal University of Santa Catarina.

What has changed in the student's profile, ambitions and performance since the beginning of your career?

I see that chemistry does not excite young people as it did when I started my degree. A likely explanation for this is the emergence of new professions and technologies.

I really don't have much clarity on this matter. But, in general, it seems to me that most students still enter chemistry courses without knowing whether they really want to pursue this career. Perhaps they consider the chemistry course as simply a way of accessing the university. I believe that due to the current situation of economic difficulty and the high unemployment rate in Brazil, access to university is a very strong reason for many young people, and for some it does not matter in which course. On the other hand, I see that chemistry does not excite young people as it did when I started my degree. A likely explanation for this is the emergence of new professions and technologies. So, although chemistry is an exciting and very important science, today's young people see other professions as being more promising. Even so, I see that the student who really chooses chemistry as a profession is enthusiastic, performs well and will be a good professional.

Perhaps, at the beginning of graduation, students should be informed about what chemistry is and how the chemist can act in society. This could encourage them to go deeper into this area of knowledge and to dedicate themselves to this profession.

Could you comment briefly on the recent evolution of analytical chemistry, considering your contributions?

Analytical chemistry, like all other sciences, evolves with both small and large contributions. I will try to summarize what I have been working on in the course of my professional career. I started my work with conventional UV-Vis spectrometry and then with FIA. At the time, UV-Vis spectrometry was a well-established technique and did not seem to require innovation. However, with the advent of miniaturized systems and the ease with which UV-Vis spectrometry could be used in routine and field analysis, new applications of this technique have emerged. Thus, I continued contributing to the development of UV-Vis applications until the present day.

During my PhD, I had contact with ICP-MS. At the time, ICP-MS was quite new, especially here in Brazil, and many studies were related to the development of methods to minimize or eliminate interference.

The use of mathematical equations, cold plasma, addition of gases to plasma, ETV and on-line matrix separation was the focus of these studies. I mainly studied ways to eliminate spectral interferences through solid–liquid separation and the use of ETV. However, ICP-MS has evolved and current instruments are equipped with reaction/collision cells in which a large part of the spectral interferences can be eliminated easily and quickly.

In the first decade of the 2000s I had contact with LA, for introducing samples into ICP-MS, and with chemical speciation analysis. I have been working mainly on the spatial distribution of elements (image) in different materials with LA-ICP-MS and on the determination of different chemical species of elements such as As, Hg, Sn and Sb by liquid chromatography coupled to ICP-MS, gas chromatography coupled to ICP-MS and ion chromatography coupled to ICP-MS. In summary, I tried to contribute a little in the areas mentioned here and in human resources training with knowledge related to the respective analysis techniques.

What are your lines of research? You have published many scientific papers. Would you highlight any?

Since the beginning of my activities in chemistry I have been working in the area of analytical chemistry, focused on the development of analytical methods and instrumentation. When possible, I try to develop work that aims at some practical application. Briefly, my work involves the use of techniques such as UV-Vis spectrometry, ICP-MS and ICP-OES. Regarding my publications, I have published several scientific articles and some book chapters. I prefer not to highlight any of the papers, as each one was important at the time it was done. However, I would like to highlight that the great majority of my publications are the result of my dedication, the dedication of several colleagues (from the UFSM and other institutions) and, importantly, the students who accompanied me and dedicated themselves during this period.

What is your opinion about the current progress of chemistry research in Brazil? What are the recent advances and challenges in scientific research in Brazil?

Chemistry in Brazil has experienced great advances very quickly, with important researchers involved in this development. However, in my opinion, we are going through a very delicate moment, both in teaching and in research. Very often we receive news of new budget cuts for teaching and research, activities that are fundamental for the development of the country. We also face a growing discrediting of education (teaching) and research in Brazil. Moreover, the contribution of areas such as analytical chemistry in issues related to public health is practically unknown by society. I think that one of the challenges for scientific research in Brazil is to find a way for society to see and understand the importance of “education and research” for the development of a nation. Finally, I have great admiration for those, especially the young people, who still manage to have the strength and hope to continue with science in Brazil, and I hope that we can explore real science.

For you, what have been the most important recent achievements in analytical chemistry research? What are the landmarks? What has changed in this scenario with the COVID-19 pandemic?

There have been advances in many areas of analytical chemistry and it seems to me that considerable advances have been made in the application of analytical chemistry in healthcare. The COVID-19 pandemic brought challenges to be solved in the short term and analytical chemistry made a contribution.

New technologies have brought advances in the characterization of different compounds and their interactions and effects on living beings, including humans. Similarly, new imaging techniques developed in recent years have enabled the identification and distribution of compounds in organisms, and to see interactions never seen before. Finally, the COVID-19 pandemic, which had so many negative aspects, in my view clearly indicated that science is increasingly interdisciplinary and that the exchange of information between different areas of knowledge is necessary.

There are, in Brazil and in the world, several conferences on chemistry. To you, how important are these meetings to the chemistry scientific community? How do you see the development of national chemistry meetings in Brazil?

Scientific meetings are important in different aspects, but I see the most important ones being the exchange of information, learning and personal contact with other researchers. In these events we have the opportunity to meet colleagues, researchers and students from the most diverse regions of Brazil and other countries. I believe we all have friendships and scientific relationships that were born in one of these scientific events. Since I was a student of scientific initiation in undergraduate chemistry, I have participated in the main national events, such as the meetings of the Brazilian Society for the Advancement of Science (SBPC), the Brazilian Chemical Society (SBQ), the National Meeting of Analytical Chemistry (ENQA) and others.

What is the importance of awards for the development of science and new technologies?

The awards should come from the result of the researcher's work. Therefore, I see awards in a positive way. However, the choice of a work or a researcher to be awarded is very difficult. How many good and important works are not awarded, are often not recognized or are not carried forward. In short, in my opinion, the important thing is to dedicate yourself to produce good work, aiming to be useful to society both academically and to the community in general, whether awarded or not.

For you, what is the importance of the national funding agencies for the scientific development of Brazil?

Public funding agencies are of utmost importance for scientific research and development in Brazil, because we still do not have enough financial support to maintain research activities other than public ones. Without the financial support of these agencies, I believe that scientific development would stagnate more and more.

At the moment, the situation for scientific research in Brazil is one of decreasing investment. How do you see this situation, and what would you say to young researchers?

The reduction of public investment in scientific research causes our nation to increasingly lag behind. As is known, there is no country with a good quality of life without a quality education and, consequently, good quality scientific research and technological development.

In my opinion, the reduction of public investment in research is an even bigger problem for young people, who, without a minimum level of financial support, are unable to start their research. As is well known, there is an exodus of young researchers from Brazil and also a lack of interest from the newly graduated in being researchers. I believe that funding for research and technological development (R&D) should be public; however, mechanisms must be created for the private sector to also invest in R&D. The private sector must realize and understand the real importance of R&D for the improvement of its product or its agricultural production. Society must understand that education, science and technological development bring about an improvement in the quality of life.

What advice would you give to a young scientist who wants to pursue a career in chemistry?

I would say to budding scientists that they should inform themselves as much as possible about the fundamental concepts of chemistry and physics, and relate them to other areas of knowledge.

All chemistry graduates know that chemistry is a fascinating science and that everything we see, feel, use, etc. is based on chemistry. So, I would say to budding scientists that they should inform themselves as much as possible about the fundamental concepts of chemistry and physics. They should learn about the latest developments in these sciences and relate them to other areas of knowledge. It is worth remembering that theory is always very important, but in chemistry one must experiment and be curious

and daring. Despite the difficulties of the job market, those who dedicate themselves and seek innovation will be rewarded in their professional career.

For what would you like to be remembered?

Maybe for the small contributions and for sharing the little I know with my students.