

## Brazil, an emerged power

Chemists for an emerging power. With this theme the Brazilian Chemical Society (SBQ) will discuss, during its 32<sup>nd</sup> Annual Meeting, the importance of research and innovation as the pillars that sustain a developed and sovereign nation. In central countries, technological innovation is the result of a combination of factors having as their base a solid educational system at all levels, the generation of frontier science and an industrial sector capable of absorbing this knowledge and transforming it into research and development (R&D). This model, although consolidated during the 20<sup>th</sup> century, requires the continuous attention of the state, of industrial enterprises, of social organizations and of citizens (professors, technicians, managers, business people and politicians) to guarantee a permanent integration between the scientific and technological advances essential for the generation of cutting-edge technology and economic wealth.

In recent years, the science and technology (S&T) of emerging countries such as Brazil, China and India has occupied more space in international discussions, placing these countries within the more promising economies of a globalized world. In spite of the substantial advances that Brazil has attained in the last 20 years, there is not yet an equilibrium between research and technological developments. If, on the one hand, the indicators for academic production have increased exponentially (in 2008, this was 2.12% of the total world-wide publications), the number of patents requested and filed place us far from the other emerging nations, China and India. Although the World Intellectual Property Organization (WIPO, 2008) accounted an advance of three positions compared to its previous report, Brazil continues in 24<sup>th</sup> place, demonstrating that its S&T system still has significant challenges to overcome. Even so, these data reflect an important advance in the capacity of Brazil to generate knowledge, which can also be discerned in the large number of master's and doctorate degrees awarded throughout the country, including many in important areas such as chemistry. These highly trained personnel are being absorbed principally by the public and private universities, by research institutes and similar state-supported entities. This seems natural since, at a first moment, it had been necessary to consolidate good teaching and research environments that tend to concentrate principally within the universities, justifying the breeding of this valuable professional competence. However, from the point of view of Brazilian technological development, this arrangement was prejudicial to an industrial sector that lacks cutting-edge research within the industries. The fragility of Brazilian technology does not have a single cause. It is the fruit of the lack of a scientific and technological policy from the state and the strong transnationalization of the Brazilian economy as a result of importation. This disconnection between science and local technological

development has resulted in having the majority of industries opting for importation or for the transfer of technology from the exterior, dispensing with the need for qualified professionals within the companies. Thus, academic research in all fields of chemistry has advanced fantastically but it has distanced itself from the many technological problems encountered by the great majority of Brazilian industry. The greatest challenge for Brazilian industries, as part of an emerging power, is to create an environment that can assimilate highly qualified professionals who would work in research, development and innovation (RD&I) in a globalized and competitive world. According to research carried out by the newsmagazine *The Economist Intelligence*, titled "People for Growth", Brazil lacks qualified people to work in the industrial sector. This research, supported by SAP, analyzed the statements of 944 executives from different sectors of the economy from all over the world, of which 357 were representatives of companies in the emerging markets, including Brazil. A survey by the Center for Management of Strategic Studies (CGEE), an entity linked to the Ministry of Science and Technology (MCT), investigated the distribution of persons with doctorates in Brazil from 1996 to 2003. From this group of professionals that were employed in 2004, 66% were in education, that is, they were strongly concentrated in teaching institutions, mostly state supported. Those classified in the categories of RD&I in the industry together summed only 3.75%.

This type of data leads us to reflect the following about the present political and social climate in Brazil: if Brazil has (i) a critical mass of qualified people, (ii) a favorable climate to compete at the technological level with some of the developed economies, (iii) an installed capacity to overcome the delay relative to these countries and (iv) a privileged natural abundance, the qualitative leap in RD&I that the country needs is relatively small. With the goal of attaining the hoped-for indices of the developed world, a large investment in education at all levels (elementary, secondary university and graduate studies) is fundamental. Equilibrium between employment of young scientists in the university and in the industrial sector will certainly elevate Brazil to the category of *emerged power*. SBQ, as one of the largest scientific societies in Latin America, with a strong representation of chemists working from Oiapoque, Amapa State, to Chui, Rio Grande do Sul State, and responsible for the publication of three excellent periodicals, is firmly involved in the task in which all Brazilian scientists, industrialists and politicians must participate: to see qualified human resources absorbed in the industrial sector to participate in truly national projects in RD&I.

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