

## POINT OF VIEW

# Advances in Ibero-American Analytical Chemistry

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Analytical Chemistry in Latin American countries, Spain, and Portugal is characterized by strong scientific and technological integration among research groups, driven by conferences in the field and collaborative networks that seek to address contemporary challenges through integration. Ibero-American Analytical Chemistry has served as an essential pillar of economic development, particularly in health, food safety, and the environment, and is internationally recognized for its scientific excellence. The current situation in Latin America is marked by a growing international presence, consolidated by decades of investment in human resources and infrastructure, although it also faces structural and financial challenges. There remains a gap in access to state-of-the-art equipment and chronic difficulties with laboratory maintenance and the importation of supplies. Public universities have played a key role not only in academic research but also in supporting government and private-sector initiatives.

The Ibero-American community has distinguished itself in excellence in education, with strong and active scientific societies. Organizations such as the Spanish Society of Analytical Chemistry (SEQA) and the Brazilian Chemical Society (SBQ), through its Division of Analytical Chemistry, lead teaching and research efforts, promoting international scientific cooperation. The Ibero-American Congress of Analytical Chemistry (CIAQA), held since 2005, has been the main driver of cooperation within the Ibero-American scientific community. SEQA, established in the 1980s, coordinates Spanish efforts in the field and is part of the Analytical Chemistry Division of the European Chemical Society (EuChemS). Spain plays a prominent role in the field, having hosted globally prestigious events such as Euroanalysis 2025 in Barcelona. Analytical Chemistry in Portugal is characterized by strong networking and international cooperation, notably through its active participation in the Ibero-American community, demonstrating a high degree of technological sophistication. Research in the field is concentrated in major universities that maintain a considerable output of scientific research. The Analytical Chemistry Division of the Portuguese Chemical Society (SPQ) is also a member of EuChemS.

The state of Analytical Chemistry in Latin America is marked by significant growth, with a strong focus on areas such as environmental monitoring, agribusiness, and food quality control. Countries such as Brazil, Mexico, Chile, Argentina, and Colombia lead in scientific output in the field, driven by international collaborations and laboratory modernization, although challenges such as funding continuity and access to cutting-edge technologies still exist. Brazil leads in academic output in Latin America due to investment in public universities and graduate programs. The country has more than 10 prominent public universities with extensive scientific output in the field. The National Meeting on Analytical Chemistry (ENQA) is considered the most important analytical chemistry event in Latin America and is frequently organized in conjunction with CIAQA. These events bring together hundreds of researchers from Ibero-America and strengthen scientific exchange. Mexico has several research groups that collaborate with Ibero-American researchers. The country's scientific output is driven by a diverse network of universities and the Mexican Association of Analytical Chemistry (AMQA). Argentina has made significant scientific strides in this field, with research spread across several universities. The country maintains frequent collaborations with Ibero-

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American nations through events such as the Argentine Congress of Analytical Chemistry (CAQA) and the CIAQA. Chile stands out in this field, particularly through researchers at the country's leading universities. Chile's Division of Analytical and Environmental Chemistry has organized the Meeting on Analytical and Environmental Chemistry (EQAA), bringing together professionals from various countries. The field gained recognition starting in the 1990s and is now vital to the export economy, ensuring food safety. Colombia also has prominent research groups at various universities that collaborate with Ibero-American researchers. In Colombia, technological progress stands out, with improvements in infrastructure despite limited financial support. The Colombian Society of Chemistry (SCCQ) organizes events that include topics in Analytical Chemistry. In Uruguay, analytical chemistry is limited to a few research groups, but the country is recognized as an active participant through the Uruguayan Congress of Analytical Chemistry (CUQA), a regular event that has previously been organized in conjunction with the CIAQA.

The Latin American Network for Environmental Quality Analysis (RACAL) has been strengthening cooperation through the Latin American Symposium on Environmental Analytical Chemistry (LASEAC), held since 1990 in various Latin American countries and attended by several Ibero-American researchers.

The strengthening of Analytical Chemistry in Latin America depends on continued investment and government policies that endure changes in administration. Initiatives such as CIAQA and the Brazilian Journal of Analytical Chemistry (BrJAC) aim to strengthen ties among Ibero-American researchers to create more robust research networks. Major international events such as the Analítica Latin America Congress, the Latin American Congress on Chromatography (COLACRO), and the Rio Symposium on Atomic Spectrometry (RSAS) regularly bring together hundreds to thousands of professionals, fostering a collaborative ecosystem.

COLACRO has been organized since 1986 and has already taken place in Brazil, Argentina, Mexico, Chile, Venezuela, and Portugal. The RSAS was launched in 1988 as an opportunity for Latin American students and scientists to interact with renowned scientists from around the world and has already been held in Brazil, Venezuela, Argentina, Mexico, and Chile. Another event that brings together hundreds of participants is the Ibero-American Conference on Mass Spectrometry (IberoMS), a field that has grown significantly over the past decade.

Despite these advances, the region still faces challenges, including the need for long-term sustainable investment, overcoming bureaucratic obstacles, and modernizing infrastructure in less developed areas. Cooperation among research groups in Ibero-America can be an effective way to promote the advancement of analytical chemistry in a broad and sustainable manner.



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