



Introductory editorial thematic issue: advances in geochemistry of the surface in Argentina

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Abstract

Geochemistry involves the study of the distribution, proportion, and association of chemical elements of the earth's crust that are present in different matrices such as water (sweet, saline, residual, rain, underground), soils, minerals, sediments, rocks, and air. Initially, this discipline was only used to study the composition and formation of rocks, but nowadays simultaneously relates geology to chemistry.

Keywords IV-RAGSU · Stable isotopes · Inorganic nutrients · Organic matter · Pesticides

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In Argentina, geochemistry began to be researched in the nineteenth century helped by other sciences. Initially, this branch of science was promoted by Argentina's President Domingo F. Sarmiento (1811–1888), who encouraged immigration of prestigious foreign researchers and professors (biologists, chemists, naturalists, etc.). Since 1867,

significant numbers of European professionals began to immigrate to Argentina. During that time, several scientific institutions, such as Academia Nacional de Ciencias, Observatorio Astronómico, Sociedad Científica Argentina, Academia Nacional de Ciencias Exactas, Físicas y Naturales, Colegio Nacional de Buenos Aires, among others (Rapela and Depetris 2016), were founded in Argentina. In the twentieth century, the growth of geochemistry in Argentina was sustained and promoted by university professors. Consequently, geochemistry has evolved and consolidated into a scientific activity (Rapela and Depetris 2016). The first course to include geochemistry studies was initiated in 1958 at the Universidad Nacional de La Plata. Presently, geochemistry studies are part of the curricula of the Earth Sciences of Water and Atmosphere area at the Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET). CONICET performs scientific and technical research in the country. This is the largest institution performing scientific and technological research in Argentina.

The Centro de Investigaciones Geoquímicas y de Procesos de la Superficie was created in 1998 by CONICET, at Universidad Nacional de Córdoba. Its first director was Dr. Pedro J. Depetris, a pioneer of this scientific activity in Argentina. Later, in 2007, it became the Centro de Investigaciones en Ciencias de la Tierra (CICTERRA). A group of enthusiastic researchers who worked there, led by Dr. Depetris, began to organize the first meeting of Geochemistry of the Surface (I RAGSU from "Reunión Argentina de Geoquímica de la Superficie"), which was held in Córdoba, Argentina in 2009. The purpose of this meeting was to create

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an academic scientific environment for the communication and discussion of results of the different research areas related to exogenous geochemical processes. The second meeting, II RAGSU, was held in Bahía Blanca, Argentina, in 2012, and was organized by the Instituto Argentino de Oceanografía (funded by CONICET) and the Universidad Nacional del Sur. In 2014, III RAGSU was held in Mar del Plata, Argentina, which was coordinated by the Instituto de Investigaciones Marinas y Costeras and Instituto de Geología de Costas y del Cuaternario (CONICET–Universidad Nacional de Mar del Plata). IV RAGSU was held in Puerto Madryn (Chubut), Argentina, November 22–28, 2016, under the theme: “Earth, air and water: towards the understanding of global processes.” The purpose of this meeting was to continue with the initiative generated at CICTERRA in 2009 by researchers who recognized the need for an environment for more in-depth discussions of the issues that connect earth, water, and atmospheric sciences. Thematic issues of Environmental Earth Sciences (EES) have been published from papers presented at I RAGSU and III RAGSU.

As the RAGSU conferences have grown in national and international relevance, IV RAGSU built on this to generate an atmosphere for the interaction between colleagues, collaborating with the growth of the different disciplines associated with surface geochemistry. Not only have the RAGSU conferences grown in national and international relevance, but they have also become much broader focused. Professionals from different disciplines who participated included geologists, biologists, chemists, oceanographers, hydrologists, agronomists, environmental engineers, geochemists, meteorologists, physicists, and health professionals. The main objectives of IV RAGSU were identification of environmental problems at local, regional, and/or global levels; evaluation of anthropic impacts and their possible remediation; analysis of surface geochemistry from different points of view; and investigation of isotopic, analytical, biogeochemical, sedimentary, pedological, environmental, experimental, marine, and hydrogeological perspectives. About one hundred presentations were made in either oral or poster sessions of colleagues from Argentina, Latin America and the Caribbean, and Spain. Three distinct sessions were held,

which were organized and presided over by internationally recognized researchers from Argentina, Brazil, and Spain. Furthermore, two panel discussions were held: (1) “Atmospheric dust and its role on primary productivity at sea: current state and future perspectives of the lines of research in Argentina,” in which five specialists participated, and (2) “Interaction Continent-sea: isotopes as a tool for the study of groundwater and surface waters,” in which six specialists participated. Also, a pre-meeting postgraduate course was held and its title was “Environmental Isotopes: Tools for the identification of mechanisms and sources of salinization.”

Twenty papers presented at IV RAGSU, and subsequently revised based on discussions at the conference and additional research, were selected to be published in this Thematic Issue in EES. In these manuscripts, the main topics were as follows: studies with heavy metals and trace elements (36%), analysis of stable isotopes (18%), dissolved inorganic nutrients (27%), organic matter (14%), and pesticides (5%). These studies were performed on several substrates, the main matrices being: seawater offshore and ocean (26%), soil (26%), groundwater (17%), surface water and rainwater (17%), marine organisms (9%), and sediments (4%). The main geographical regions studied were marine zone (coastal and oceanic, 24%), estuarine area (19%), river systems (streams, rivers, and wetland areas, 19%), humid pampa (10%), valleys and saws (10%), semiarid region (5%), ecotone (5%), aquifers (5%), and lagoons (5%).

In this context, it is a pleasure to participate as Guest Editors and to publish this Thematic Issue in relation to IV RAGSU. We hope that this collaboration will continue in future RAGSU Conferences. In this regard, we appreciate the great support received from Dr. James W. Lamoreaux, Editor in Chief of Environmental Earth Sciences, who actively participated in the IV RAGSU Conference.

Reference

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