



## Editorial 72

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The current issue is a mixture of *varia* articles and in addition the first half of the special issue of articles based on lectures delivered at the 25th meeting of the International Society for the Philosophy of Chemistry (ISPC). The meeting was held remotely from Buenos Aires in Argentina due to the Covid restrictions that prevailed at the time. A separate short editorial by the organizers of that meeting will follow this general editorial and the remaining articles for this special issue will appear in the subsequent edition of the journal.

The opening contribution among the *varia* articles comes from Savino Longo from the University of Bari in Italy, who presents a formal theory of the Lewis approach to chemical bonding as well as the VSEPR method for determining the shapes of molecules. The author's aim is to allow for automation in the manner in which the rules for finding Lewis structures and molecular shapes are implemented. This article may well be of interest to chemical educators, given that these topics appear to be perennial favorites in the general chemistry curriculum.

Naum Imyaninov from St. Petersburg in Russia has previously contributed several articles on the periodic table. One of his themes has been that the use of atomic number is not completely successful in classifying the elements in the periodic table and that an improvement can be achieved by focusing on the sum of differentiating electrons. In the current article Imyaninov considers internal and secondary periodicities that are known to exist within the periodic table. Internal periodicity occurs among the later d-block elements such as Fe–Zn, which repeat the properties of the early ones, Sc–Mn, to some extent. Meanwhile secondary periodicity is the phenomenon whereby elements belonging to periods with even values of  $n+l$  quantum numbers seem to resemble each other and similarly those with odd values also do. For example, the properties of the odd elements B–Ne, Ga–Kr, Tl–Rn in the p-block are closer to each other than to properties of even elements Al–Ar, In–Xe, and vice versa.

The third article concerns green chemistry which broadly speaking falls within the domain of the ethics of chemistry. Parveen Sharma, from the delightfully named Lovely Professional University in India, believes that it is necessary to integrate the concepts of

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green chemistry with present agriculture methods. Her article proposes 12 new principles of a sustainable agriculture that are inspired by the existing 12 Green chemistry principles.

The final contribution in the varia section comes from the US organic chemist Jeffrey Seeman who presents a review of a book by the Cal Tech chemist Jay Labinger that is titled *Connecting Literature and Science*. Rather unusually perhaps, the reviewer appears to have conducted some extended E-mail correspondence with the author, such that the latter has been invited into the review, as it were. Be that as it may, the result in an in-depth analysis of the contents of the book, including some of the authors otherwise hidden motivations, a rich account of Labinger's scientific career and the avoidance of acrimony that one sometimes sees in book reviews. I am even tempted to suggest that future book reviewers might be encouraged to contact the author while preparing their manuscripts, since this would surely reduce the possibility of the kind of unfriendly remarks that can be devastating to anybody who has taken the time and trouble to put together a book length treatment on any serious subject.

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## Editorial for special issue of papers presented at the 25th meeting of the International Society of Chemistry

Olimpia Lombardi, Juan Camilo Martínez González<sup>1</sup>

After a one-year pandemic break, the symposium of the International Society for the Philosophy of Chemistry was held again as a virtual meeting in 2021. On this occasion, the 25th conference was organized remotely, from Buenos Aires, Argentina. The symposium was sponsored by the National Council of Scientific and Technological Research (CONICET), the University of Buenos Aires (UBA), and the Austral University, and was organized by Olimpia Lombardi and her research group in philosophy of chemistry: Hernán Accorinti, Fiorela Alassia, Jesús Jaimes Arriaga, Juan Camilo Martínez González, and Alfio Zambon. This special issue brings, in two parts, the selected paper from the Buenos Aires conference. The topics discussed included the history of chemistry, as well ontological, epistemological, and pedagogical issues that arise from the practice of chemistry. This 25th conference included 29 speakers from 13 countries. The complete list of speakers and their abstracts are found at: <https://sites.google.com/site/socphilchem/history?authuser=0>.

In this first part of the special volume, we share contributions from Alfio Zambon, Eric Scerri, Fiorela Alassia, and Marina Paola Banchetti-Robino.

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In his contribution “Chemical reactivity: cause-effect or interaction?”, Alfio Zambon confronts the notions of causation and interaction in chemistry, argues for an interaction view and proposes a complementary representation scheme called “interaction diagram”, that allows representing chemical reactions through a geometric diagram. The author argues that understanding of this diagram facilitates the analysis of reactions in terms of interactions, or reciprocal actions, among the participating entities. Zambon describes the model and provides examples in order to discuss the scope and limitations of the current status of the development of his model.

Eric Scerri’s contribution “Hasok Chang on the nature of acids” critically examines what Hasok Chang claims to be a rupture in the definition of the concept of acidity. Scerri claims that there is no such rupture but a genuine generalization when moving from the Bronsted-Lowry theory to the Lewis theory of acidity. The author also points out how the quantification and measurement of Lewis acidity can be realized using equilibrium theory and stability constants.

In the article titled “A process ontology approach in biochemistry: the case of GPCRs and biosignaling”, Fiorella Alassia proposes extending the arguments of process ontology formulated by Stein (2004, 2005, 2006) and Stephan Guttinger (2018) about enzymes to another case study within the biochemical domain: the case of ligand receptors and receptor-mediated biosignaling. The aim of the work is to analyze the case of G Protein-Coupled Receptors (GPCRs) and biosignaling under the consideration of a processual ontology. Alassia argues that the processual ontology framework is more adequate than the traditional views for understanding the biochemical domain, and that it allows one to account for current accounting for the current biochemical knowledge related to the case study.

Finally, in her contribution “Robert Boyle and the Relational and Dispositional Nature of Chemical Properties”, Marina Banchetti-Robino claims that Robert Boyle’s complex chemical ontology implies a non-reductionistic conception of chemical qualities and, more specifically, a dispositional and relational conception of chemical qualities. While Peter Anstey has already shown that that Boyle considered sensible qualities to be dispositional and relational, Banchetti-Robino moves beyond Anstey’s work by extending his arguments to chemical properties. In turn, a further argument shows that Boyle regards chemical and other higher-level properties as being emergent and supervenient.

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