



Microchimica Acta: a top analytical chemistry journal for disseminating research involving micro and nanomaterials

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Since October 2019 (A. Escarpa) and January 2020 (M. Prodromidis), we have the great responsibility to run, as Editors-in-Chief, *Microchimica Acta*. In this editorial, we would like to share with our authors and reviewers the view of the editorial team about *Microchimica Acta* and besides, to define in detail which articles *Microchimica Acta* seeks to publish.

Microchimica Acta has established itself as a premier forum for novel research in chemical and biochemical analytical sciences based on the use of advanced micro/nano-structured materials and noteworthy, this key requirement for a manuscript to be published in *Microchimica Acta* has been fully adopted by the researchers of the peer-community, as the number of submitted manuscripts that fall outside the aim and scope of *Microchimica Acta* is incredibly low (<5%).

Nanomaterials have played a vital role in the growth of various scientific disciplines including Analytical Chemistry. This fact opened huge research opportunities towards the discovery of new materials and their use in the development of (bio)analytical methods or (bio)sensors with exceptional analytical performance, or at least, with attractive detection capabilities. As a result, an overwhelming majority of the analytical scientific works that have been published during the last decade were designed to include nanomaterials aiming to harness the analytical advantages associated with their unique properties. Indeed, the use of nanomaterials is often claimed

to be the key element of such research, thus underpinning the novelty of these publications. In turn, this fact triggered an enormous research effort, combining diverse (both existing and/or newly discovered) materials in the development of analytical methods for the determination of analytes with interest in various fields including clinical chemistry, medical diagnostics, food chemistry, environmental chemistry, pharmaceutical chemistry, civil security, to name a few.

This two-way synergy between nanomaterials and Analytical Chemistry was further boosted by the fact that the isolation of graphene (one of the most popular nanomaterials) ignited the development of various nanomaterials that collectively created profound and wide interest in the scientific community. Developments in polymer chemistry, the emergence of inorganic layered materials and their exfoliated counterparts, as well as the enzyme-mimicking properties of nanozymes, amongst others, have (and continue to do so) contributed to significant advances in Analytical Chemistry.

However, advantages do not come without disadvantages. Besides notable breakthroughs, ordinary modifications of existing materials and/or the use of (unnecessarily) complex composite materials have resulted in a large number of papers with moderately improved analytical performance, and thus incremental impact.

The comparison of novelty (and impact) between, on the one hand, a paper presenting a truly advanced nanomaterial coupled with a “proof-of-concept” analytical application and, on the other hand, a paper describing a problem-solving analytical application by using already established micro/nanomaterials is difficult. This requires establishing a primordial definition of the term “proof-of-concept” for analytical applications. In some cases, the lack of analytical data under real-world conditions is labeled as “proof-of-concept” application. Obviously, a (bio)sensor or a (bio)analytical method, based on an innovative nanomaterial which enables the determination of an analyte in standard solutions only or in spiked real-world samples fortified with the target analyte at concentrations higher than the normal range or the upper allowed

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limit set by the regulatory bodies, has a negligible impact in Analytical Chemistry.

Microchimica Acta, as an Analytical Chemistry journal, publishes articles on “novel methods of modern chemical, biochemical and biological analysis based on the use of (advanced) micro/nano-materials.” In this regard, it is essential for any submitted work to contain data demonstrating (i) the calibration features of the method, (ii) the selectivity of the method over other compounds that exist in real-world samples, (iii) the recovery of the method in complex matrices, (iv) the validity of the analytical results with respect to a reference material or a well-established (reference) method, (v) enhanced analytical performance over existing methods, and (vi) applicability to real-world samples. Towards this goal, *Microchimica Acta* is very much interested in publishing articles that address analytical challenges, which despite their seemingly paramount importance (for example, selectivity and fouling issues), are frequently overlooked.

Besides, *Microchimica Acta* expands its coverage to novel (bio)analytical methods and devices that provide expedient solutions to the most contemporary demands in (bio)chemical sensing, such as point-of-care and on-site applications, wearable (bio)sensors, in vivo monitoring, tissue-embedded sensor-based diagnostics, or alarm systems, (bio)sensing applications by using micro/nanomotors, sensing materials based on synthetic biology, and biomedical imaging and targeting.

Microchimica Acta also aims to publish review articles that provide a critical assessment of research progress in the scientific fields covered by the journal. Review articles are considered for publication after invitation. Alternatively, prospective authors of review articles are requested to send a proposal containing a detailed outline of the planned review and a justification for publication in *Microchimica Acta* (see at <https://www.springer.com/604>). We take the opportunity to invite our authors to send us their review proposals. In addition, *Microchimica Acta* has inaugurated the publication of Topical Collections. Topical Collections aim to collect high-quality articles dealing with any emerging topic of paramount interest in the field of analytical sciences based on micro and nanomaterials, according to the aims and scope of *Microchimica Acta*.

To ensure a high quality of the published articles, the editorial team of *Microchimica Acta* consists of a unique group of Senior Associate Editors and Associate Editors with expertise in the relevant areas of analytical sciences based on micro and nanomaterials (<https://www.springer.com/604/editors>). *Microchimica Acta* has established a comprehensive internal reviewing system that aims to (a) warrant the scientific and formal quality of the manuscripts by avoiding certain scientific and formal deficiencies and (b) assist mainly our young authors to prepare top-quality manuscripts.

While the Editors-in-Chief and Senior Associate Editors perform an assessment of the manuscript with respect to quality and suitability according to the high standards of the journal, the team of Associate Editors implements an internal reviewing process, which aims to screen the manuscripts with respect to various scientific and formal issues and suggests appropriate corrections. Some key points that are considered in the evaluation of submitted works that we wish to bring to the attention of our authors are summarized in the following comments:

- When the target analyte is undoubtedly present in the sample (for example, glucose in blood, creatinine in urea), the data should demonstrate that the method enables the determination of the target analyte in unspiked samples. In some articles, the target analyte cannot be detected, for example, due to the very high dilution or the high limit of detection of the method, so the authors resort to the use of spiked samples. However, a method that is not able to determine a naturally occurring compound in a specific sample is of limited impact.
- When spiking is necessary to demonstrate the applicability of the method (for example, a cancer biomarker in a biological sample or to study the recovery of the method), spiking should be conducted at the beginning of the whole analytical process. The target analyte should be added to the undiluted samples while the choice of the spiked concentrations of the analyte should be justified by providing correct references using a source of information (e.g., results of clinical studies) or normative documentation (e.g., from World Health Organization).
- The interference study should include those compounds frequently present in the examined sample. Indeed, the interference effect of the examined compounds should be evaluated at a concentration level that reflects the concentration ratio (interference compound/target analyte) in the analyzed sample.
- Synthetic protocols of new materials should be concisely described but without unnecessary details. Experimental procedures (quantities, reaction times, work-up, purification steps, etc.) should be specified so other people can reproduce the proposed synthetic work.
- The assay procedure should be described in detail. A protocol on how to perform the assay with a sample (amount of the sample, how the sample is treated, addition of reagents, dilution ratio, how analytical data are generated, etc.) is necessary for any method to be used by others.

Manuscripts are further evaluated by at least two expert reviewers whose priceless contribution to reach the anticipated quality of the published articles is highly appreciated. We believe that this highly qualified editorial team and the stringent reviewing process will warrant the excellence of the work

published in *Microchimica Acta* both now and in the future. Finally, the editorial team strives for a fast publication process, however, without compromising the quality criteria set by the journal.

Instead of an epilog, we would like to mention all the people who support the editorial team of *Microchimica Acta*, Dr. Steffen Pauly (Springer Nature Chemistry Editorial Director), Senior and Associate Editors, Dr. Wolfgang Frenzel and Dr. Jolanta Oleksy-Frenzel (Managing Editors), and Dr. Beatriz Jurado Sánchez (Assistant Editor) and thank them for their invaluable support. Thanks are also extended to our authors and reviewers for helping us to maintain the high standard of the journal.

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Declarations

Conflict of interest The authors declare that they have no competing interests.

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