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Foreword

Column liquid chromatography is employed predominantly for the separation of organic compounds, however this technique continues to grow in importance for the speciation and analysis of inorganic solutes. The introduction of ion chromatography, by Hamish Small and co-workers at Dow Chemical in 1975, provided a foundation for renewed interest in the analysis of inorganic solutes by column liquid chromatography. Their work demonstrated new possibilities for conductivity detection; specifically, that it could serve as a continuous, sensitive and universal detection method for ionic species. The technique of ''ion chromatography'' was subsequently licensed to the Dionex Corporation who have continued to develop this approach to the point where it is now well established and approved by numerous regulatory agencies.

The introduction of ion chromatography (IC) also prompted investigation into other separation and detection approaches for the chromatography of inorganic compounds. While ion exchange remains the primary separation mode, other approaches used for the separation of inorganic species include ion interaction, ion exclusion and chelation chromatography, in addition to reversed phase separations of metal complexes. Advances in suppressor technology have improved the sensitivity and ease of use of suppressed conductivity detection, although non-suppressed conductivity and indirect (or vacancy) detection methods are still employed as alternatives for universal detection. Direct detection methods have proven to be highly selective for absorbing or electroactive species, while post-column derivatization followed by UV–Vis absorption or fluorescence is an important detection approach for transition metals, lanthanides and actinides. Additionally, the use of more advanced detection techniques for IC, such as MS and ICP-MS, continue to be explored.

The articles contained in this special issue on column liquid chromatography of inorganic species reflect the diversity of chromatographic approaches used for the determination of such solutes. These contributions illustrate that new stationary phases and eluent systems continue to be explored in the search for novel selectivities. Similarly, improvements in detection hardware and methodology permit still lower detection limits and broaden the applicability of column liquid chromatography for the determination of inorganic species. Many of the workers who have contributed key elements to the revolution in inorganic analysis over the past two decades are represented in this issue, which deals specifically with column liquid chromatography. However other separation techniques such as electrophoresis and gas chromatography are not forgotten and will be the subject of future Special Issues. Finally, Erich Heftmann deserves acknowledgement for his editorial efforts and for gathering such an interesting collection of manuscripts.

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