Chromatography
Separation Techniques

Buckley, J Chromat Separation Techniq 2012, 3:6
DOI: 10.4172/2157-7064.1000e105

Editorial Open Access

Don't Forget What Else is on the Table

Brian Buckley*

Executive Director of Laboratories, Environmental and Occupational Health Sciences Institute, Rutgers University, USA

We have been trained to think about chromatography for separation of organic molecules be they large or small. Most of the advances over the years have been made in separating larger and larger biomolecules as we go from peptides to proteins to DNA but all, essentially organic molecules. Lipidomics has brought back the notion that normal phase chromatography still has a place in our world of separation as non polar solvents can still be used as mobile phases.

This process has left a significant portion of the periodic table behind; forgetting about what other plates, cups and cutlery are left on our table. The recent publicity in the United States about arsenic in food is an appropriate demonstration that the other elements require separation of species and should not be ignored when considering advances in solid phase. Mercury, arsenic and chromium are three prime examples of elements that have vastly different toxicological properties based on oxidation state or organometallic species. The bioavailable properties of inorganic ions are driven by their chemical form and measuring the total concentration of these elements no longer provides enough information. Investigators studying nutrition such as which form of Mg more effectively enters a cell or performing risk calculations on whether the chromium in dust is a micronutreint (Cr III) or a lung carcinogen (Cr VI) with the information they need. Arsenic has multiple forms depending on the source, some of which are extremely toxic such as MMA III (0.1 μM LC_{50}) while the arseno sugars are thought to be non toxic. The field of metallomics is one of the newer omics disciplines and it is driven by the need to quantify the *chemical form* of the metal in question. While many of these chemical forms involve the organic moiety adducted to the inorganic ion, the overall separation generally requires attention to both the ionic or polar properties and the organic properties of the analyte.

I believe this is important because the advances in solid phase materials have seen very little progress in the separation of ionic species, bound or unbound. It is an area that appears the most challenging as the solid phase will need to provide differential retention of all properties of the analyte. It appears that mixed bed columns will provide the centerpiece for a periodic table that has been set by the field or metallomics. Metal speciation has only begun to carve a niche in the world of metal assays but it provides a cornucopia of new chromatographic possibilities because separation is the first step in any aqueous phase speciation technique.

There is a table before us rich with new chromatographic applications and looking only at the organic portion of the periodic table leaves so much more to consume. Consider what else is on the periodic table when looking to the future of chromatography.

***Corresponding author:** Brian Buckley, Executive Director of Laboratories, Environmental and Occupational Health Sciences Institute, Rutgers University, New jersey, USA, E-mail: bbuckley@eohsi.rutgers.edu

Received September 24, 2012; **Accepted** September 26, 2012; **Published** September 30, 2012

Citation: Buckley B (2012) Don't Forget What Else is on the Table. J Chromat Separation Techniq 3:e105. doi:10.4172/2157-7064.1000e105