TOPIC: QuEChERS Approach in Chemical Residues Analysis

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Present position:
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BIOGRAPHY

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Education:

- Ph.D. Analytical Chemistry (minor in Environmental Sciences), Dept. of Chemistry, University of Florida, Gainesville, FL, 1992
- B.S. Chemistry, Dept. of Chemistry; University of Florida, Gainesville, FL, 1987

Work Experience:

2000-present *Lead Scientist*, USDA ARS, ERRC, Wyndmoor, PA,;USA
1999-2000 *Research Chemist* USDA ARS, ERRC, Wyndmoor, PA; USA
1992-1999 *Research Chemist*, USDA ARS, Beltsville Agricultural Research Center, Beltsville, MD; USA
1987-1988 *Chemist*, Environmental Sciences and Engineering, Gainesville, FL; USA

Research Interests:

Since 1992, scientific investigations and method development research have involved improvement in the analysis of pesticides, veterinary drugs, and other contaminants in food and environmental samples. Research has pertained to sample preparation, cleanup, analytical separations, detection, screening, quantitation, confirmation, and data processing using many types of analytical techniques applied in novel ways.

Selected Awards:

- UCT Excellence in SPE Award, 2007
- AOAC International Study Director and Collaborative Study of the Year, 2007
- Fellow of AOAC International, 2006
- Eastern Regional Research Center Distinguished Scientist of the Year, 2005
- Bronze Medal - Federal Executive Board Excellence in Government, 2003
- AOAC International Study Director and Collaborative Study of the Year, 2002
- Most Interesting Poster Award (shared) at 4th European Pesticide Residue Workshop, 2002
- North Atlantic Area Early Career Scientist of the Year, 2000
- Beltsville Area Technology Transfer Award, 1997

Scientific Publications:

Author/co-author of >90 scientific publications and >130 abstracts; Invited to give >50 talks at scientific meetings

ABSTRACT

QuEChERS as a method and an approach for sample preparation in chemical residue analysis

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The original "quick, easy, cheap, effective, rugged, and safe" (QuEChERS) method for pesticide residue analysis of fruits and vegetables was introduced at the 4th European Pesticide Residue Workshop in Rome in 2002 and is detailed in subsequent publications. QuEChERS incorporates streamlined extraction and cleanup techniques (sample miniaturization, salt-out partitioning extraction by shaking in a single tube, and dispersive solid-phase extraction cleanup) to provide a highly flexible sample preparation template that can be used in multiple modified versions and applications. With respect to pesticide residue analysis, there are two independent and interlaboratory-validated methods under the auspices of AOAC International (AOAC Official Method 2007.01) and European Committee for Standardization (CEN Standard Method EN 15662). Along with the original version that did not employ buffering, these official buffered QuEChERS methods have been validated for hundreds of pesticides and commodities and implemented in countless residue monitoring labs worldwide. At least 11 companies are marketing QuEChERS sample preparation products for use in pesticide residue analysis and for adaptation in other applications. This includes the analysis of acrylamide, veterinary drug residues, clinical assays, forensics, and environmental methods. More than 100 peer-reviewed papers have been published on QuEChERS and dispersive-SPE, and the original QuEChERS paper in 2003 has been cited more than 200 times. In this presentation, a history of the QuEChERS method(s) and its evolution into an approach for many applications will be described. The QuEChERS "baby" of Anastassiades and Lehotay born in the USDA-ARS lab outside Philadelphia has become a "teenager" that does not know its full potential or its limits yet, and the speaker intends to provide guidance of how QuEChERS concepts can help streamline sample preparation, and when it will likely fail to do so.

Keywords: sample preparation; chemical residues; analysis