

Chemical Contaminants & Residues in Food Community

Metals Sub-group

- Metals
 - toxic elements
 - nutrient elements
 - chemical form of elements (speciation)
- Foods Consumed
 - Includes
 - Infant formula
 - Beverages
 - Foodware
 - Dietary supplements

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Finite Set of Elements

The Periodic Table of the Elements

1 H Hydrogen 1.00794																	2 He Helium 4.003
3 Li Lithium 6.941	4 Be Beryllium 9.012182											5 B Boron 10.811	6 C Carbon 12.0107	7 N Nitrogen 14.00674	8 O Oxygen 15.9994	9 F Fluorine 18.9984032	10 Ne Neon 20.1797
11 Na Sodium 22.989770	12 Mg Magnesium 24.3050											13 Al Aluminum 26.981538	14 Si Silicon 28.0855	15 P Phosphorus 30.973761	16 S Sulfur 32.066	17 Cl Chlorine 35.4527	18 Ar Argon 39.948
19 K Potassium 39.0983	20 Ca Calcium 40.078	21 Sc Scandium 44.955910	22 Ti Titanium 47.867	23 V Vanadium 50.9415	24 Cr Chromium 51.9961	25 Mn Manganese 54.938049	26 Fe Iron 55.845	27 Co Cobalt 58.933200	28 Ni Nickel 58.6934	29 Cu Copper 63.546	30 Zn Zinc 65.39	31 Ga Gallium 69.723	32 Ge Germanium 72.61	33 As Arsenic 74.92160	34 Se Selenium 78.96	35 Br Bromine 79.904	36 Kr Krypton 83.80
37 Rb Rubidium 85.4678	38 Sr Strontium 87.62	39 Y Yttrium 88.90585	40 Zr Zirconium 91.224	41 Nb Niobium 92.90638	42 Mo Molybdenum 95.94	43 Tc Technetium (98)	44 Ru Ruthenium 101.07	45 Rh Rhodium 102.90550	46 Pd Palladium 106.42	47 Ag Silver 107.8682	48 Cd Cadmium 112.411	49 In Indium 114.818	50 Sn Tin 118.710	51 Sb Antimony 121.760	52 Te Tellurium 127.60	53 I Iodine 126.90447	54 Xe Xenon 131.29
55 Cs Cesium 132.90545	56 Ba Barium 137.327	57 La Lanthanum 138.9055	58 Ce Cerium 140.90765	59 Pr Praseodymium 140.90765	60 Nd Neodymium 144.24	61 Pm Promethium (145)	62 Sm Samarium 150.36	63 Eu Europium 151.964	64 Gd Gadolinium 157.25	65 Tb Terbium 158.92534	66 Dy Dysprosium 162.50	67 Ho Holmium 164.93032	68 Er Erbium 167.26	69 Tm Thulium 168.93421	70 Yb Ytterbium 173.04	71 Lu Lutetium 174.967	
87 Fr Francium (223)	88 Ra Radium (226)	89 Ac Actinium (227)	90 Th Thorium (232)	91 Pa Protactinium (231.03588)	92 U Uranium (238.0289)	93 Np Neptunium (237)	94 Pu Plutonium (244)	95 Am Americium (243)	96 Cm Curium (247)	97 Bk Berkelium (247)	98 Cf Californium (251)	99 Es Einsteinium (252)	100 Fm Fermium (257)	101 Md Mendelevium (258)	102 No Nobelium (259)	103 Lr Lawrencium (262)	

Some interest in speciation: Hg, As, Se, Cd

Update on Work

- Web Page
 - “About” Page
 - Method Needs Sought
 - Reports
 - Emails to Metals Sub-group
 - Member list (37)
- Emails
 - 2008-05-26: Website, call for method needs
 - 2008-09-09: Interest in listed “Method Needs”, sub-group survey (type of business; methods currently using; methods being developed/validated), example documents on single laboratory validation)

Method Need Status

- Asked Sub-group Members
 - September 2007
 - May 2008
 - September 2008
- Some feedback (only a few reply, <10)
 - Current “Most Interest”
 - Arsenic speciation
 - Methylmercury
 - As, Cd, Pb, Hg by ICP-MS
 - Iodine
 - Selenium speciation

Why No “Needs”?

- Methods available (level of validation varies)
- Method improvements/modification sought for new technology but task can still be done with old technology
- Multi-laboratory collaborative study not demanded
- Some members are method users; not method developers (their labs have specified methods for their particular need).

Observations

- No unified urgent “Need” surfaced
- Some labs are developing the methods they need (improved methods)
- Some labs modify existing methods to meet their needs
- In-house validation sufficient
- Potential issues
 - Researchers don’t want to share method development research until they have published.
 - Methods developed are based on lab’s available equipment.

Community Partition

Laboratories (Methods)

Private
Government
Academic
Instrument

Sub-group

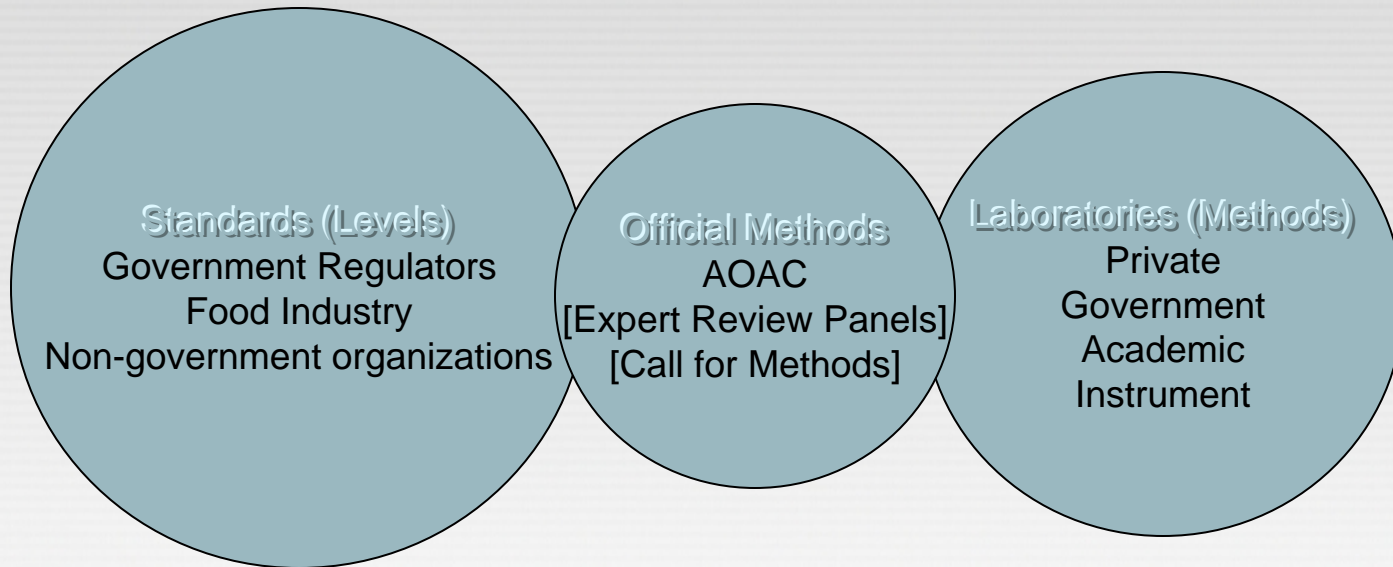
Standards (Levels)

Government Regulators
Food Industry
Non-government organizations

Official Methods

AOAC
[Expert Review Panels]
[Call for Methods]

Urgent Method Need



Metals Subgroup Future Activities

- Develop single laboratory validation guidelines
- Validate methods using guidelines; publish
- Encourage membership; need larger representation
- Gather more information on member participation
 - Expert reviewer for AOAC
 - Participate in multi-laboratory trials
 - Share methods being developed
- Gather information on methods being used
 - Study similarity of methods
 - Share information with members
- Predicting future needs