



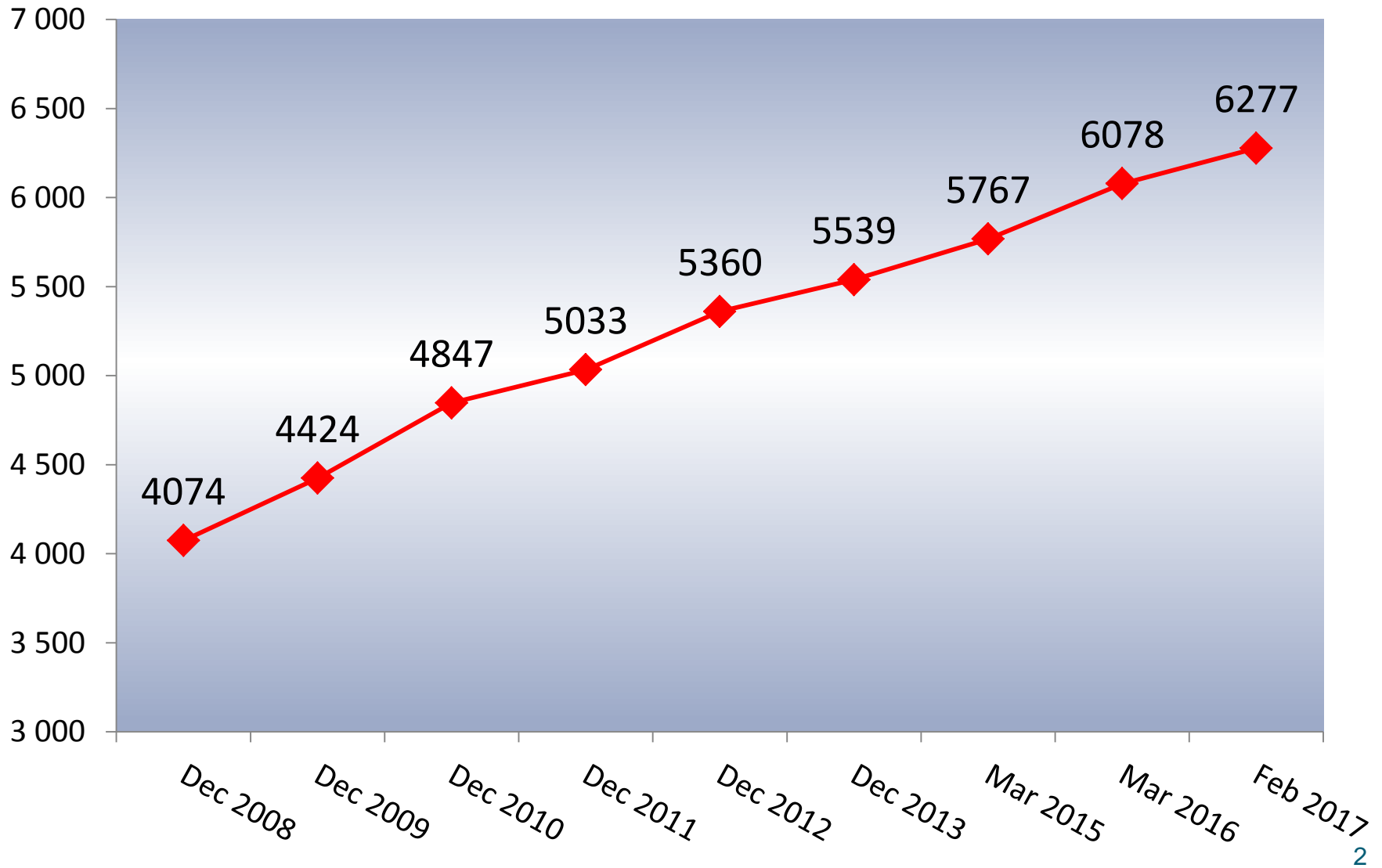
Evolution of KCs and CMCs from 2013 to 2016

A KCWG perspective

Della SIN and Angelique Botha

CCQM Strategic Plan Workshop 2017-2026, 26 April 2017,
BIPM, France

Growth rate of ChemBIO CMCs



Resources spent on underpinning CMCs

**Number of KCs/SCs and CMCs (as at Apr. 2017)
[figures of Apr. 2016]**

<u>CC</u>	<u>No. of KC/SC</u>	<u>No. of CMCs</u>	<u>No. of CMCs per KC/SC</u>
CCAUV	59	1162	19.7 [20.4]
CCEM	230	4472	19.4 [21]
CCRI(II)	234	4099	17.5 [14.8]
CCL	122	1615	13.2 [13.7]
CCM	360	2754	7.7 [8.7]
CCPR	88	1269	14.4 [15.8]
CCTF	2	753	376.5 [738]
CCT	108	2545	23.6 [27.9]
CCQM	268	6227	23.2 [27.1]

Strategies for the reduction of KCs

OAWG Four-Track Strategic Approach for Comparison Studies

Track A: Key comparisons that test Core Competencies for the delivery of Measurement Services to Customers

- Providing Primary Calibration Reference Services
- Providing Accuracy Control Reference Services

Limited number in which all NMIs with relevant claims expected to participate

Track B: Key Comparisons that Assess the Equivalence of Measurement Services actually provided to Customers

- Certified Reference Materials
- Value-Assigned PT Samples

Limited number to be assessed over time after reviewing services

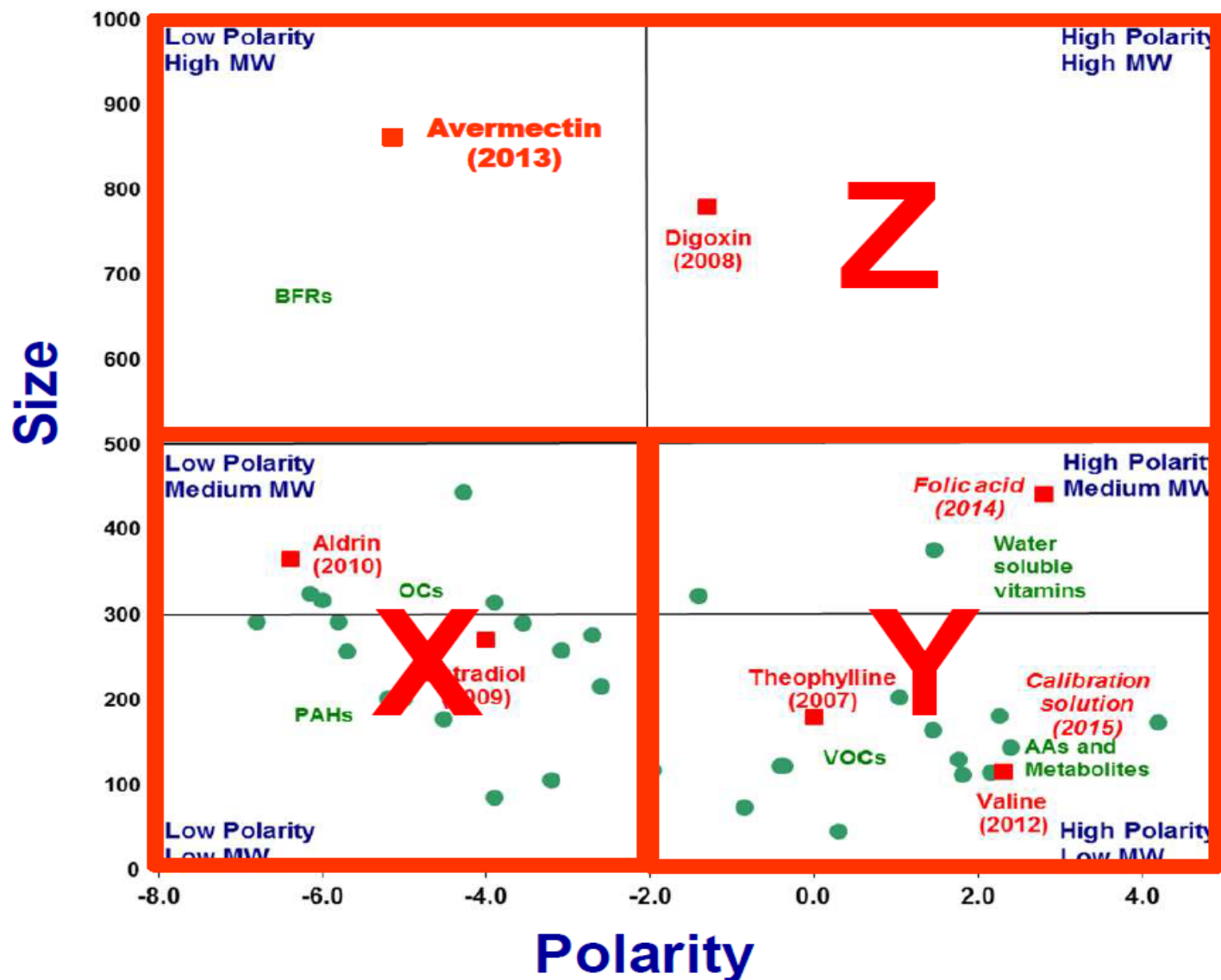
Track C: Key Comparison studies in emerging areas of global interest and importance

5 NMIs must agree to participate for study to go forward as Key Comparison

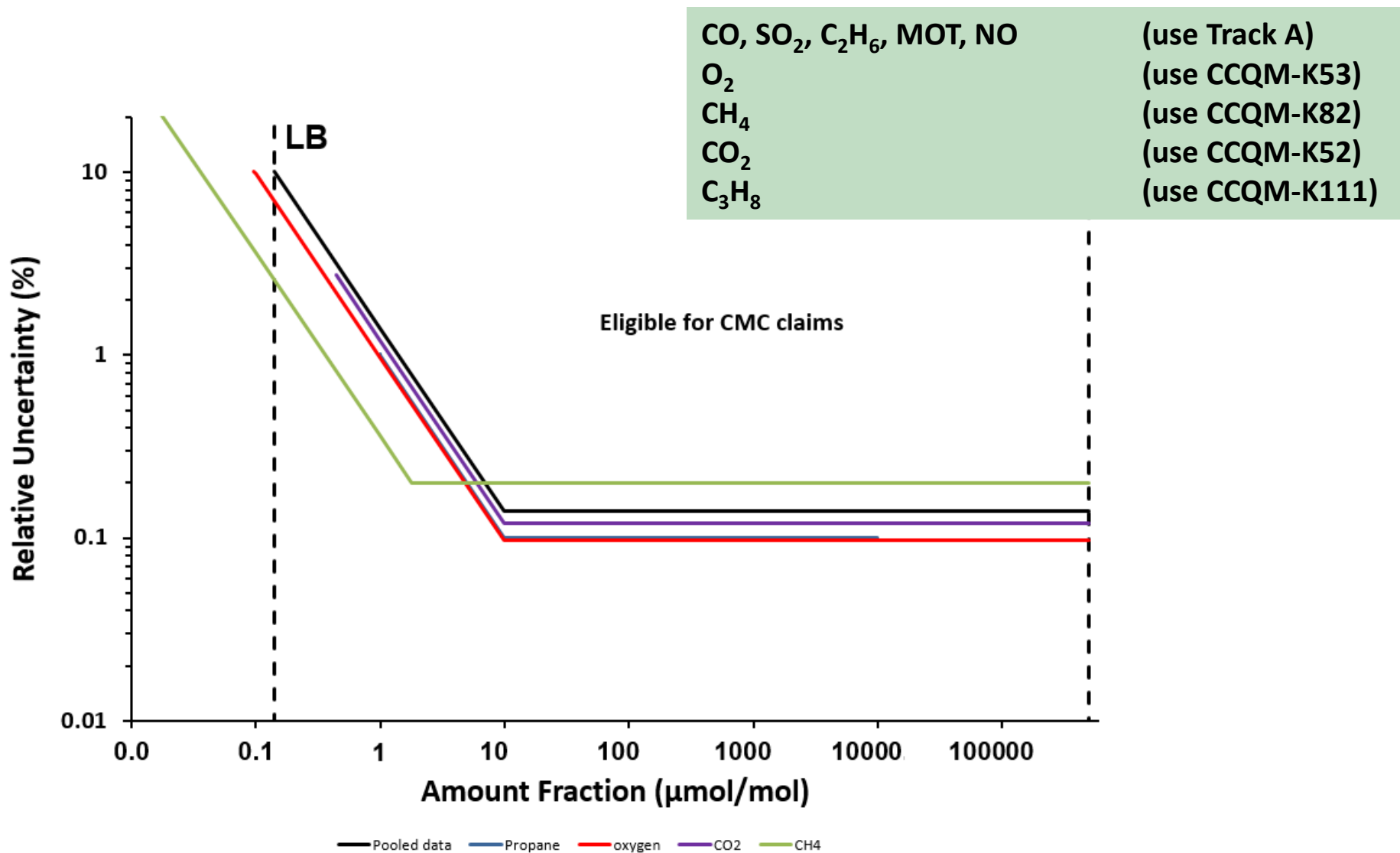
Track D: Capability Assessment studies of measurement capabilities being established in new areas for NMIs/DIs

Results of these Studies will not be used for assessment of CMCs

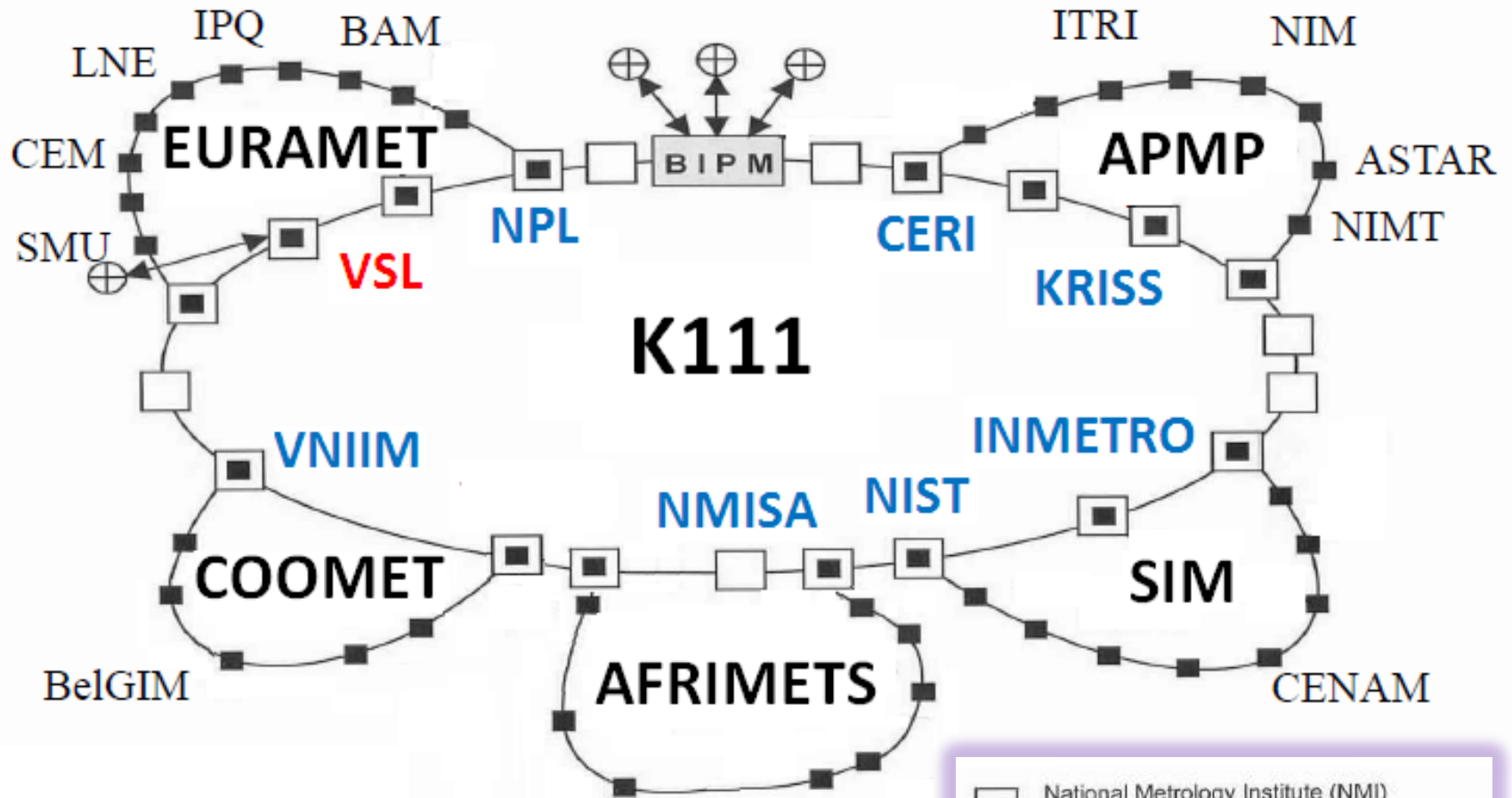
High purity organics measurement space



Core key comparisons for Gas Analysis



Sharing the load with RMOs



Evolution of CMCs

One-to-one relationship

<u>Meas. Serv. Cat. No.</u>	<u>Meas. Serv. Sub-Category No.</u>	<u>Meas. Serv. Category</u>	<u>Matrix</u>	<u>Measurand</u>				<u>Dissemination Range of Measurement Capability</u>		
				<u>Analyte Group Identifier</u>	<u>Analyte or Component</u>	<u>CAS Number</u>	<u>Quantity</u>	<u>From</u>	<u>To</u>	<u>Unit</u>
11	11.1	Nutritional constituents	Rice powder		Calcium	7440-70-2	Mass fraction	10	2000	mg/kg
11	11.1	Nutritional constituents	Wheat powder		Calcium	7440-70-2	Mass fraction	10	2000	mg/kg
11	11.1	Nutritional constituents	Corn powder		Calcium	7440-70-2	Mass fraction	10	2000	mg/kg

Evolution of CMCs

Broader matrix

<u>Meas. Serv. Cat. No.</u>	<u>Meas. Serv. Sub-Category No.</u>	<u>Meas. Serv. Category</u>	<u>Matrix</u>	<u>Measurand</u>				<u>Dissemination Range of Measurement Capability</u>		
				<u>Analyte Group Identifier</u>	<u>Analyte or Component</u>	<u>CAS Number</u>	<u>Quantity</u>	<u>From</u>	<u>To</u>	<u>Unit</u>
11	11.2	Contaminants	Cereal and cereal products		Arsenic	7440-38-2	Mass fraction	0.05	0.5 1.00	mg/kg



Evolution of CMCs

Broadening the matrix and the analytes

<u>Meas. Serv. Cat. No.</u>	<u>Meas. Serv. Sub-Category No.</u>	<u>Meas. Serv. Category</u>	<u>Matrix</u>	<u>Measurand</u>				<u>Dissemination Range of Measurement Capability</u>		
				<u>Analyte Group Identifier</u>	<u>Analyte or Component</u>	<u>CAS Number</u>	<u>Quantity</u>	<u>From</u>	<u>To</u>	<u>Unit</u>
11	11.1	Nutritional constituents	Food and food supplements		Essential elements Cu, Fe, Se, Zn, I		Mass fraction	0.1	50	µg/g



Broad claim CMCs (Organics in matrix)

Meas. Serv. Cat. No.	Meas. Serv. Sub-Category No.	Meas. Serv. Category	Matrix	Measurand				Dissemination Range of Measurement Capability			Range of Expanded Uncertainties as Disseminated					
				Analyte Group Identifier	Analyte or Component	CAS Number	Quantity	From	To	Unit	From	To	Unit	Cov. factor	Lev. of confid.	Is the expanded uncertainty a relative error?
13	13.1	sediments	abiotic dried matrices		non-polar organic molecules (MW 100-800 g/mol, polarity pKow < -2)	n.a.	mass fraction	1	1000	µg/kg	10	25	%	2	95 %	yes
13	13.1	sediments	sediment		low polarity molecular weight 100-800 g/mol organic		Mass fraction	1	1000	µg/kg	1	11.1	%	2	95	yes
13	13.2	soil	soil		low polarity molecular weight 100-800 g/mol organic		Mass fraction	1	15000	µg/kg	3	11.1	%	2	95	yes



Planned review of existing CMCs

Measurement Category	Claims in KCDB	% of Claims approved in and before 2009	Measurement Category	Claims in KCDB	% of Claims approved before 2009
1. Pure chemicals	656	41	8. Metals and alloys	226	2
2. Inorganic solutions	409	0	9. Advanced materials	144	29
3. Organic solutions	498	70	10. Biological fluids and materials*	399	41
4. Gases*	2340	39	11. Food	502	2
5. Water	224	3	12. Fuels	61	0
6. pH	92	3	13. Sediments, soils	562	87
7. Electrolytic conductivity	45	0	14. Other	61	56
Red: Re-reviewed in last 5 years (* partially) (# before re-reviewed in Cycle XVIII) Blue: Not yet re-reviewed Green: Under re-reviewing in this cycle			15. Surfaces, films, and engineered nano-materials	8	50



Thank you

CIPM MRA