

Potential Priority Chemicals

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Purpose of agenda item

- ▶ Panel consideration of two classes of chemicals as potential priority chemicals:
 - *ortho*-Phthalates
 - Perfluoroalkyl and polyfluoroalkyl substances (PFASs)

Criteria for recommending priority chemicals (SB 1379)

- ▶ The degree of potential **exposure** to the public or specific subgroups
- ▶ The **likelihood of a chemical being a carcinogen or toxicant** based on peer-reviewed health data, the chemical structure, or the toxicology of chemically related compounds
- ▶ The **limits of laboratory detection** for the chemical, including the ability to detect the chemical at low enough levels that could be expected in the general population
- ▶ **Other criteria** that the panel may agree to

Background: *ortho*-Phthalates

- ▶ Some phthalates were added as designated chemicals via inclusion in CDC's National Biomonitoring Program*
- ▶ March 2009: SGP recommended that these phthalates be added as priority chemicals
- ▶ July 2015: SGP recommended adding the class "*ortho*-phthalates" to the list of designated chemicals

*Inclusion in CDC's National Reports on Human Exposure to Environmental Chemicals program

Background: PFASs

- ▶ Twelve perfluorochemicals (PFCs) were added as designated chemicals via inclusion in CDC's National Biomonitoring Program
- ▶ July 2009: These PFCs were added as priority chemicals based on SGP recommendation
- ▶ March 2015: SGP recommended adding the class "perfluoroalkyl and polyfluoroalkyl substances (PFASs)" to the list of designated chemicals

Examples of *ortho*-phthalates that would be included as priority chemicals if class is listed

Example <i>ortho</i> -phthalates	Selected metabolites identified in human urine	Detections in dust
Di- <i>n</i> -hexyl phthalate	--	✓
Di- <i>n</i> -pentyl phthalate	Mono-(4-hydroxypentyl) phthalate	✓
	Mono- <i>n</i> -pentyl phthalate	
Dipropyl phthalate	--	✓
Di- <i>n</i> -heptyl phthalate	--	✓
Di-isoheptyl phthalate	--	✓
Di-2-propylheptyl phthalate	Mono-2-(propyl-6-hydroxyheptyl) phthalate	--
	Mono-2-(propyl-6-oxoheptyl) phthalate	
Didodecyl phthalate	--	✓
Diundecyl phthalate	--	✓

Highlights on *ortho*-phthalates

- ▶ *ortho*-Phthalates continue to be the most widely used plasticizers worldwide, representing 70% of the global plasticizer market in 2014
 - China is projected to be the top consumer of plastic additives, including phthalates, by 2019
 - The dioctyl sub-type of phthalates (DEHP is one example) still dominates the global phthalate plasticizer market; however, regulation of DEHP is shifting this market
- ▶ Some phthalates mentioned in recent patents that are not currently on the list of priority chemicals include:
 - Diallyl phthalate
 - Dihexyl phthalate
 - Hydroxypropyl methyl cellulose phthalate (HPMCP)

Example PFASs that would be included as priority chemicals if class is listed

Example PFASs		Detections in humans
Perfluoroalkyl carboxylic acids	Perfluorobutanoic acid	Serum, urine
	Perfluoropentanoic acid	Serum, urine
	Perfluorohexanoic acid	Serum, urine
	Perfluorotridecanoic acid	Serum
	Perfluorotetradecanoic acid	Serum
Perfluoroalkane sulfonic acids	Perfluoropentane sulfonic acid	Serum
	Perfluoroheptane sulfonic acid	Serum
	Perfluorodecane sulfonic acid	Serum
	Perfluoro-4-ethylcyclohexane sulfonic acid	--
Polyfluoroalkyl phosphoric acid esters (PAPs)	6:2 DiPAP	Serum, breast milk
	8:2 DiPAP	Serum, breast milk
	10:2 DiPAP	Serum, breast milk
Perfluoroalkyl phosphinic acids (PFPIAs)	C6/C6 PFPIA	Serum
	C6/C8 PFPIA	Serum
Fluorotelomer sulfonic acids (FtSs)	6:2 FtS	Serum
	8:2 FtS	Serum
Perfluoroalkyl ether carboxylic acids and sulfonic acids		--

Highlights on PFASs

- ▶ Perfluoroalkyl ether carboxylic acids (PFECAs) and sulfonic acids (PFESAs) have become PFOA replacements as processing aids in fluoropolymer manufacturing
 - 12 previously undiscovered PFECAs and PFESAs were identified in surface water in North Carolina

(Strynar et al., Environ Sci Technol, 2015)

- ▶ In study of effluents from municipal and industrial waste water treatment plants in San Francisco Bay:
 - Levels of short-chain PFASs (PFBA, PFHxA) significantly increased compared to a study conducted in 2009
 - Elevated concentrations of 6:2 fluorotelomer sulfonate (FtS) (as well as PFOS) were apparent in some treatment plants from firefighting foam contamination

(Houtz et al., submitted for publication in Water Research, 2015)

Analytical methods

- ▶ PFASs (Environmental Chemistry Lab):
 - Existing method measures 12 PFASs and can be expanded to include additional analytes
 - A second method is being finalized for analysis of a wide-range of PFASs including polyfluorinated and short-chain compounds

- ▶ *ortho*-Phthalates (Environmental Health Lab):
 - Measures 10 phthalate metabolites and is being expanded to include two additional metabolites
 - Can be expanded further to target additional phthalates, pending identification of appropriate biomarkers

Options for the Panel

- ▶ Recommend the class “*ortho*-phthalates” be added to the list of priority chemicals
- ▶ Recommend the class “perfluoroalkyl and polyfluoroalkyl substances (PFASs)” be added to the list of priority chemicals
- ▶ Defer consideration of one or both classes
- ▶ Decide against adding one or both classes as priority chemicals