

Table S4. Results of AOP analyses for major 190 chemicals.

AOP Name	Counts	Major chemicals and processes		
200 Estrogen receptor activation leading to breast cancer	37	Chemical Name	CAS No.	Process in Semiconductor
		2,2',6,6'-Tetrabromobisphenol A	79-94-7	Semiconductor and other electronic component manufacturing
		2-Butoxyethanol	111-76-2	Overall Chip assembly
		Acetaldehyde	75-07-0	Mold, Chip assembly
		Antimony trichloride	10025-91-9	Semiconductor Manufacturing
		Arsenic trioxide	1327-53-3	Semiconductor Manufacturing
		Bisphenol A	80-05-7	Packaging
		Catechol	120-80-9	Wafer processing, Photo/PR removal
		Diethanolamine	111-42-2	Stripper: Used to remove unnecessary photoresist layers after photo-resist patterning and development during photo processing
		Ethylene glycol	107-21-1	CVD, Dry etching, Wafer processing, Ion implantation
		Glycerol	56-81-5	Solder ball attachment, Chip assembly
		n-Butyl alcohol	71-36-3	Semiconductor Manufacturing
		Perfluorooctane sulfonic acid	1763-23-1	Photomicroolithography
		Phenol	108-95-2	Mold, Chip assembly
		Tetrachloroethylene	127-18-4	Mold, Chip adhesion, Chip assembly, Testing
		Zinc chloride fume	7646-85-7	Semiconductor Manufacturing
		1-Methoxy-2-propanol	107-98-2	Wafer processing, Photo (PR solvent)
		1-nitronaphthalene	86-57-7	Small Molecule Semiconductor Building Blocks
		2-Methoxyethanol	109-86-4	Manufacture of wafers for semiconductor manufacturing
		4-Chloro-2-methylphenol	1570-64-5	Semiconductor Manufacturing
Diethylene glycol monobutyl ether	112-34-5	Semiconductor Manufacturing		
Diethylene glycol monobutyl ether	112-34-5	Semiconductor Manufacturing		
Dimethyl acetamide	127-19-5	Photo (Diluent)		
Nitrobenzene	98-95-3	Semiconductor Manufacturing		
Indium phosphide	22398-80-7	Manufacture of semiconductor wafers		
Methyl-3-methoxy propionate	3852-09-3	Wafer processing, Photo (PR solvent)		
Piperazine	110-85-0	Chip assembly, Rear Grinding		
Tetramethyl ammonium hydroxide	75-59-2			
	10424-66-			
	5(Trihydrate)		Wafer processing, Chip assembly, Photo (developer), Rear Grinding	
	10424-65-4(Pentahydrate)			
Trimellitic anhydride	552-30-7	-		
187 Anticoagulant rodenticide inhibition of vitamin K epoxide reductase resulting in coagulopathy and hemorrhage	31	Chemical Name	CAS No.	Process in Semiconductor
			156-59-2	
		1,2-Dichloroethylene, all isomers	156-60-5	Washing
			540-59-0	
		2,2',6,6'-Tetrabromobisphenol A	79-94-7	Semiconductor and other electronic component manufacturing
		Acetaldehyde	75-07-0	Mold, Chip assembly
		Acetone	67-64-1	Overall process, Mold, Wafer processing, Printing, Chip adhesion, Chip assembly

Antimony trichloride	10025-91-9	Semiconductor Manufacturing
Arsenic trioxide	1327-53-3	Semiconductor Manufacturing
Bisphenol A	80-05-7	Packaging
Catechol	120-80-9	Wafer processing, Photo (PR removal)
Ethylene glycol	107-21-1	CVD, Dry etching, Wafer processing, Ion implantation
Isopropyl alcohol	67-63-0	Washing, Cleaning solution (PM), Wafer processing, Maintenance, Chip assembly, Photo (PR solvent)
Methylchloro-isothiazolinone	26172-55-4	Semiconductor Manufacturing
Perfluorooctane sulfonic acid	1763-23-1	Photomicroolithography
Polyethylene polypropylene glycol	9003-11-6	Chip assembly
Pyrene	129-00-0	Ultra-high purity chemicals for Spin-On-Hard mask
Silica, amorphous	7631-86-9 112926-00-8	Polycrystalline silicon and silicon dioxide materials are etched in semiconductor manufacturing
Zinc chloride fume	7646-85-7	Semiconductor Manufacturing
1-Methoxy-2-propyl acetate	108-65-6	Wafer processing, Chip assembly, Photo (PR solvent)
2-Heptanone	110-43-0	Wafer processing, Photo (PR solvent)
4-Chloro-2-methylphenol	1570-64-5	Semiconductor Manufacturing
Epichlorohydrin	106-89-8	-
Heptane	142-82-5	Chip assembly, Mold etc.
Nitrobenzene	98-95-3	Semiconductor Manufacturing
Phosphoric acid	7664-38-2	Wafer processing, Wet etching
Piperazine	110-85-0	Chip assembly, Rear Grinding

60 NR1I2 (Pregnane X Receptor, PXR) activation leading to hepatic steatosis

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Chemical Name	CAS No.	Process in Semiconductor
2,2',6,6'-Tetrabromobisphenol A	79-94-7	Semiconductor and other electronic component manufacturing
Bisphenol A	80-05-7	packaging
Methylchloro-isothiazolinone	26172-55-4	Semiconductor Manufacturing
Perfluorooctane sulfonic acid	1763-23-1	Photomicroolithography
Polyethylene polypropylene glycol	9003-11-6	Chip assembly
Pyrene	129-00-0	Ultra-high purity chemicals for Spin-On-Hard mask
Tetrahydrofuran	109-99-9	Mold, Solder ball attachment, Chip assembly, Rear Grinding
Zinc chloride fume	7646-85-7	Semiconductor Manufacturing
1-nitronaphthalene	86-57-7	Small Molecule Semiconductor Building Blocks
2-Methoxyethanol	109-86-4	Manufacture of wafers for semiconductor manufacturing
Dimethyl acetamide	127-19-5	Photo (Diluent)
Ethyl acetate	141-78-6	Chip assembly, Chip adhesion, Mold, Solder ball attachment, etc.
Methyl isobutyl ketone	108-10-1	Chip assembly, Mold, etc.

36 Peroxisomal Fatty Acid Beta-Oxidation Inhibition leading to Steatosis

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Chemical Name	CAS No.	Process in Semiconductor
2,2',6,6'-Tetrabromobisphenol A	79-94-7	Semiconductor and other electronic component manufacturing
Acetaldehyde	75-07-0	Mold, Chip assembly

58 NR1I3(CAR) suppression leading to hepatic steatosis

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Acetic acid	64-19-7	Washing, Wet etching, Wafer processing
Antimony trichloride	10025-91-9	Semiconductor Manufacturing
Bisphenol A	80-05-7	packaging
2-Heptanone	110-43-0	Wafer processing, Photo (PR solvent)
Phosphoric acid	7664-38-2	Wafer processing, Wet etching
Chemical Name	CAS No.	Process in Semiconductor
2,2',6,6'-Tetrabromobisphenol A	79-94-7	Semiconductor and other electronic component manufacturing
2-Butoxyethanol	111-76-2	Overall Chip assembly
Antimony trichloride	10025-91-9	Semiconductor Manufacturing
Bisphenol A	80-05-7	Packaging
Catechol	120-80-9	Wafer processing, Photo (PR removal)
Cresol	o-Cresol 95-48-7 p-Cresol 106-44-5 m-Cresol 108-39-4	Mold, Wafer processing, Chip assembly, Photo (PR solvent)
Diethanolamine	111-42-2	Stripper: Used to remove unnecessary photoresist layers after photo-resist patterning and development during photo processing
Dimethylformamide	68-12-2	Mold
Perfluorooctane sulfonic acid	1763-23-1	Photomicro lithography
Phenol	108-95-2	Mold, Chip assembly
Zinc chloride fume	7646-85-7	Semiconductor Manufacturing

66 Modulation of Adult Leydig Cell Function Subsequent Glucocorticoid Activation in the Fetal Testis

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Chemical Name	CAS No.	Process in Semiconductor
2,2',6,6'-Tetrabromobisphenol A	79-94-7	Semiconductor and other electronic component manufacturing
Acetaldehyde	75-07-0	Mold, Chip assembly
Antimony trichloride	10025-91-9	Semiconductor Manufacturing
Bisphenol A	80-05-7	Packaging
Catechol	120-80-9	Wafer processing, Photo (PR removal)
Glycerol	56-81-5	Solder ball attachment, Chip assembly
Perfluorooctane sulfonic acid	1763-23-1	Photomicro lithography
Pyrene	129-00-0	Ultra-high purity chemicals for Spin-On-Hard mask
Zinc chloride fume	7646-85-7	Semiconductor Manufacturing

107 Constitutive androstane receptor activation leading to hepatocellular adenomas and carcinomas in the mouse and the rat

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Chemical Name	CAS No.	Process in Semiconductor
2,2',6,6'-Tetrabromobisphenol A	79-94-7	Semiconductor and other electronic component manufacturing
Acetaldehyde	75-07-0	Mold, Chip assembly
Bisphenol A	80-05-7	Packaging
Catechol	120-80-9	Wafer processing, Photo (PR removal)
Perfluorooctane sulfonic acid	1763-23-1	Photomicro lithography
Pyrene	129-00-0	Ultra-high purity chemicals for Spin-On-Hard mask
1-nitronaphthalene	86-57-7	Small Molecule Semiconductor Building Blocks
2-(2-Aminoethoxy)-ethanol	929-06-6	Wafer processing
Piperazine	110-85-0	Chip assembly, Rear Grinding

61 NFE2L2/FXR activation leading to hepatic steatosis

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Chemical Name	CAS No.	Process in Semiconductor
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150 Aryl hydrocarbon receptor activation leading to early life stage mortality, via reduced VEGF

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2,2',6,6'-Tetrabromobisphenol A	79-94-7	Semiconductor and other electronic component manufacturing
Acetaldehyde	75-07-0	Mold, Chip assembly
Antimony trichloride	10025-91-9	Semiconductor Manufacturing
Bisphenol A	80-05-7	Packaging
Catechol	120-80-9	Wafer processing, Photo (PR removal)
Cresol	o-Cresol 95-48-7 p-Cresol 106-44-5 m-Cresol 108-39-4	Mold, Wafer processing, Chip assembly, Photo (PR solvent)
Isopropyl alcohol	67-63-0	Washing, Cleaning solution (PM), Wafer processing, Maintenance, Chip assembly, Photo (PR solvent)
Zinc chloride fume	7646-85-7	Semiconductor Manufacturing
2-Heptanone	110-43-0	Wafer processing, Photo (PR solvent)

Chemical Name	CAS No.	Process in Semiconductor
Bisphenol A	80-05-7	Packaging
Catechol	120-80-9	Wafer processing, Photo (PR removal)
Dimethyl sulfoxide	67-68-5	Stripper: Used to remove unnecessary photoresist layers after photo-resist patterning and development during photo processing
Methylchloro-isothiazolinone	26172-55-4	Semiconductor Manufacturing
Pyrene	129-00-0	Ultra-high purity chemicals for Spin-On-Hard mask
Zinc chloride fume	7646-85-7	Semiconductor Manufacturing
1-Methoxy-2-propyl acetate	108-65-6	Wafer processing, Chip assembly, Photo (PR solvent)
1-nitronaphthalene	86-57-7	Small Molecule Semiconductor Building Blocks
1-Nitropropane	108-03-2	Semiconductor Manufacturing

153 Aromatase Inhibition leading to Ovulation Inhibition and Decreased Fertility in Female Rats

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Chemical Name	CAS No.	Process in Semiconductor
2,2',6,6'-Tetrabromobisphenol A	79-94-7	Semiconductor and other electronic component manufacturing
Acetaldehyde	75-07-0	Mold, Chip assembly
Catechol	120-80-9	Wafer processing, Photo (PR removal)
Dimethyl sulfoxide	67-68-5	Stripper: Used to remove unnecessary photoresist layers after photo-resist patterning and development during photo processing
Isopropyl alcohol	67-63-0	Washing, Cleaning solution (PM), Wafer processing, Maintenance, Chip assembly, Photo (PR solvent)
Perfluorooctane sulfonic acid	1763-23-1	Photomicrolithography
Diethylene glycol monobutyl ether	112-34-5	Semiconductor Manufacturing

163 PPARgamma activation leading to sarcomas in rats, mice, and hamsters

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Chemical Name	CAS No.	Process in Semiconductor
2,2',6,6'-Tetrabromobisphenol A	79-94-7	Semiconductor and other electronic component manufacturing
Acetaldehyde	75-07-0	Mold, Chip assembly
Bisphenol A	80-05-7	Packaging
Catechol	120-80-9	Wafer processing, Photo (PR removal)
Perfluorooctane sulfonic acid	1763-23-1	Photomicrolithography
1-nitronaphthalene	86-57-7	Small Molecule Semiconductor Building

Blocks

Etc.

minor -

