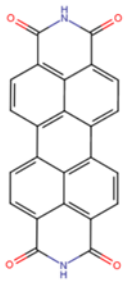
February 2017
Office of Chemical Safety and
Pollution Prevention
U.S. EPA

Preliminary Information on Manufacturing, Processing, Distribution, Use, and Disposal:

Anthra[2,1,9-def:6,5,10-d'e'f'] diisoquinoline-1,3,8,10(2H,9H)-tetrone

Pigment Violet 29

CASRN: 81-33-4



February 2017

Support document
for Docket EPA-HQ-OPPT-2016-0725

This document provides a preliminary public summary of available information collected by EPA's Office of Pollution Prevention and Toxics (OPPT) in the Office of Chemical Safety and Pollution Prevention (OCSPP) on the manufacturing (including importing), processing, distribution in commerce, use, and disposal of this chemical. This is based on existing data available to EPA, including information collected under the Chemical Data Reporting rule, information from other Agency databases, other U.S. Government agencies, publicly available information from states, and a review of published literature. In addition, the document includes information reported to EPA by producers and users of the chemical in the United States and in other countries.

This preliminary use information and any additional use information received in the docket by March 15, 2017 will inform efforts to develop the scope of the chemical risk evaluation required under section 6(b)(4) of the Toxic Substances Control Act, and will inform any risk management efforts following risk evaluation.

Mention of trade names in this document does not constitute endorsement by EPA. To verify products or articles containing this chemical currently in commerce, EPA has identified several examples. Any lists are provided for informational purposes only. EPA and its employees do not endorse any of the products or companies.

This document does not contain confidential business information (CBI).

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POINT OF CONTACT

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Docket: EPA-HQ-OPPT-2016-0725

MANUFACTURING, PROCESSING, DISTRIBUTION, USE AND DISPOSAL

1. Manufacturing (Including Importing)

For the 2012 Chemical Data Reporting (CDR) period, data reported indicate that four sites in the United States domestically manufactured 520,916 lbs. of PV29[1]. In the 2012 CDR reporting period there was no reported importing of PV29 to the United States. However, there may be smaller volumes imported into the U.S. not captured by the CDR, based on distributers described in Table 3. Reports for the 2012 CDR period indicate that an estimated 100-249 commercial and industrial sites with 100-499 workers use PV29.

CDR data submitted in 2016 indicates that PV29 is manufactured (including imported) in the United States[2]. The number of firms and amount manufactured is confidential business information (CBI). The amount imported was 0 lbs; however, smaller importing operations did not report to CDR in 2016. As was the case during the 2012 CDR period, reports for the 2016 CDR period indicate that an estimated 100-249 commercial and industrial sites with 100-499 workers use PV29.

PV29 is not reported to the Toxics Release Inventory (TRI).

Manufacturing Process

Ullmann's Encyclopedia of Industrial Chemistry describes the chemical reaction to produce PV29.

> "When naphthalimide is heated to 220˚C with caustic potash [1310-58-3] and sodium acetate [127-09-3], the potassium salt of the leuco form of perylenetetracarboxylic diimide is formed. This product is subsequently oxidized in aqueous solution to form perylene diimide [81-33-4]… The diimide in turn forms perylene dianhydride on hydrolysis with concentrated sulfuric acid at 215˚C. The diimide and the dianhydride are starting materials for the synthesis of aliphatic- and aromatic-substituted diimides. The latter constitute an important class of red dyes and pigments used in the production of color-fast plastics and coatings." (Ullmann's Encyclopedia of Industrial Chemistry, Vol. 7, Page 121, (2000))

[1] Manufacturers (including importers) are required to report under CDR if they meet certain production volume thresholds, generally 25,000 lb or more of a chemical substance at any single site. Reporting is triggered if the annual reporting threshold is met during any of the calendar years since the last principal reporting year. In general, the reporting threshold remains 25,000 lb per site. However, a reduced reporting threshold (2,500 lb) now applies to chemical substances subject to certain TSCA actions. https://www.epa.gov/chemical-data-reporting/how-report-under-chemical-data-reporting

[2] Manufacture means to manufacture, produce, or import for commercial purposes. Manufacture includes the extraction, for commercial purposes, of a component chemical substance from a previously existing chemical substance or complex combination of chemical substances. (40 CFR 711.3)
https://www.epa.gov/sites/production/files/2015-12/documents/cdr_fact_sheet_importers_final_dec2015_0.pdf

Data is available regarding the manufacture of PV29 and the activities or processes at the workplace at ECHA's website. It is copyrighted and therefore is not being reproduced here.

https://echa.europa.eu/brief-profile/-/briefprofile/100.001.223

2. Processing

For the 2012 CDR period, four firms reported processing PV29. The processing of PV29 is through incorporation into a formulation, mixture or reaction[3]. This substance is used for the manufacture of plastic and rubber products, paints, and coatings. PV29 can be used in a variety of plastics applications such as polyolefins, polyvinyl chloride (PVC), polyurethane (PUR), polystyrene (PS), styrene butadiene (SB), styrene acrylonitrile (SAN), and other polymers (BASF, 1998).

http://www2.basf.us/additives/pdfs/Paliogen_Redviolet_K5011.pdf

Processing information from the 2016 CDR period is CBI.

3. Products and Articles

EPA has identified the following examples. This list is provided for informational purposes only. EPA and its employees do not endorse any of the products or companies.

Table 1: List of Industrial and Commercial Products

Trade name	Use of the Product	% by weight of chemical	Link to references, SDS or industry information
Domestic Products			
3,4,9,10-Perylenetetracarboxylic diimide	industrial pigment, tunable laser dye, light-harvesting material, transistor, molecular switched, solar cell, and optoelectronic device. Planar perylene- and naphthalene-based diimide linkers can be employed to tether the Watson- Crick and the Hoogsteen strands of a DNA triplex, thus providing conjugates capable of targeting singlestranded nucleic acids with the formation of hairpin triplexes.	NA	https://www.alfa.com/en/catalog/044098/ https://www.alfa.com/en/content/msds/USA/44098.pdf
Various coatings	Coating for professional use; transportation industry – light and commercial vehicles Industrial use-potentially including uses such as motors, generators, vehicle components, sporting goods, appliances, architectural uses, agricultural equipment's, oil and gas pipelines.	Not available	http://www.axaltacs.com/corporate/en_US.html http://www.color.tc/US_SDS/SDS/US_EN_1250007862_CRMX.pdf

Trade name	Use of the Product	% by weight of chemical	Link to references, SDS or industry information
PALIOGEN® Red Violet K 5011	vat dyes, pigments for colouring plastics and high-grade industrial paints	75-80%	http://www2.basf.us/additives/pdfs/Paliogen_Red_K3580.pdf https://www.scribd.com/document/234875898/BASF-Colourant-2005
1029 Perylene Violet 29	plastics and solvent industrial coatings applications	NA	http://www.pigments.com/Products/Organic-Pigments/Violet/1029-Perylene-Violet-29.aspx
Perrindo Violet 29 229-4050	coating application for packaging, paper, architectural, arts and crafts, powder coatings, industrial, automotive, toner, inkjet, publication	NA	http://www.dic-global.com/jp/en/products/pigments/general/ http://www.sunchemical.com/?s=violet&post_type_filter=product-pigment&order=asc
International Products			
Polyketone pigment chip-C.I. Pigment Violet 29, Mauve	metal decoration paint, high temperature colorant for plastic, polyester fiber, ink and adhesion	NA	https://www.alibaba.com/product-detail/Polyketone-pigment-chip-C-I-Pigment_553396785.html
Luprofil Violet 50-1105 C4	mass-dyeing of polypropylene yarns and fibers	40%	http://www.col9.com/portal/streamer?fid=422243 http://worldaccount.basf.com/wa/NAFTA~en_US/Catalog/Pigments/doc4/BASF/PRD/30048503/.pdf?asset_type=msds/pdf&language=EN&validArea=US&urn=urn:documentum:ProductBase_EU:09007af880393a3e.pdf
Palamid Violet 50-1105	pin-dyeing of polyamide yarns and fibers	25%	http://www.xymara.com/portal/streamer?fid=422244

Table 2: List of Consumer Products

Product types	Product names	% by weight of chemical	Link to SDS or other Information and References
Water colors	Utrecht Artists' Watercolors	NA	http://images.utrechtart.com/Content/pdf/MSDS/UtrechtArtistsWatercolors.pdf
Water colors	Utrecht Designers' Foundation Gouache Set of Eight, Item 6018	NA	http://images.utrechtart.com/Content/pdf/MSDS/UtrechtDesignersGouache.pdf
Water Color	Professional Water Color Tube, 14ml, Perylene Violet	NA	http://www.winsornewton.com/na/shop/water-colour/professional-water-colour http://d4of2brjuv1jo.cloudfront.net/assetfiles/3b66a55d-9f40-4008-af19-ab034c5ef82aSAFETY%20DATA%20SHEET-12251-1-1.pdf https://www.amazon.com/Winsor-Newton-Professional-Perylene-Violet/dp/B0038M1UJW/ref=sr_1_2?ie=UTF8&qid=1481907520&sr=8-2&keywords=pigment+violet+29
Water Color	Synchromatic Transparent Water Color, 0.5 oz, Violet (29)	NA	https://www.amazon.com/Dr-Ph-Martins-Synchromatic-Transparent/dp/B009ORFMXA/ref=sr_1_16?ie=UTF8&qid=1481907520&sr=8-16&keywords=pigment+violet+29 https://www.docmartins.com/collections/synchromatic-transparent-bottles/products/synchromatic-transparent-water-color-0-5-oz-29
Water Color	Perylene Violet (PV29) Daniel Smith Extra Fine Watercolors	NA	http://www.danielsmith.com/ItemFiles/MSDS/MSDS_US00144_284-600-201_03192014.PDF
Water colors for painting	MISSION WATERCOLOR	5-15%	https://images0.gerstaecker.de/out/pdf/pboxx-pixelboxx-2431076/Sicherheitsdatenblatt++MIJELLO+MISSION+Gold+Aquarellfarbe.pdf
Fine art painting-acrylic	Winsor & Newton Professional Acrylic Perylene Violet	NA	http://d4of2brjuv1jo.cloudfront.net/assetfiles/95d92f4a-b5be-4366-8320-21be2477ce65SAFETY%20DATA%20SHEET-12532-1-1.pdf

More broadly, perylene pigments such as PV29 are found in automotive coatings and are used for coloring fiber. Perylene pigments are also used in high performance applications and PV29 is one of 3 types of perylene pigments used for coloring plastics. When perylenes are used in olefins that are stabilized with HALS (Hindered Amine Light Stabilizers) UV Stabilizers, the stabilizers will become less effective when exposed to light and pigment concentration is high. Therefore, perylenes are not used frequently in the PVC of automotive interiors. (M. Herman, Encyclopedia of Polymer Science and Technology 3rd Ed., page 240 (2013))

EU information regarding articles that PV29 is found in is available at the ECHA website. It is copyrighted and therefore is not being reproduced here. (https://echa.europa.eu/brief-profile/-/briefprofile/100.001.223)

4. Distribution (Includes Retailers)

Based on information reported to CDR 2016, one facility manufacturers PV29 for wholesale and retail trade.

Table 3: List of Distributors

Product	Description and price	References
Suppliers Domestically		
Oakwood Products 3,4,9,10-Perylenetetracarboxylic acid diimide (468673)	USA $75/100g $155/250g $24/25g $12/5g	http://www.oakwoodchemical.com/ProductsList.aspx?CategoryID=-2&txtSearch=165577
Parchem Perylene-3,4,9,10-tetraformyldiimine	USA Have to request quote	http://www.parchem.com/chemical-supplier-distributor/Perylene-3-4-9-10-tetraformyldiimine-007596.aspx
Ark Pharm, Inc. Anthra[2,1,9-def:6,5,10-d'e'f']diisoquinoline-1,3,8,10(2H,9H)-tetraone	USA 95+% $71/100g	http://www.arkpharminc.com/product/detail/AK307667.html
AK Scientific, Inc. 3,4,9,10-Perylenetetracarboxylic diimide	USA 99% $20 S&H $22.95/5g $56/25g $208/100g	http://aksci.com/item_detail.php?cat=L419 https://www.molport.com/shop/molecule-link/MolPort-001-814-872 http://aksci.com/sds/L419_SDS.pdf
TCI America 3,4,9,10-Perylenetetracarboxylic Diimide	USA and Japan >95.0%	http://www.tcichemicals.com/eshop/en/us/commodity/P0984/
Suppliers or Manufacturers Internationally		
Bide Pharmatech Ltd. Anthra[2,1,9-def:6,5,10-d'e'f']diisoquinoline-1,3,8,10(2H,9H)-tetraone	China 95+% $71/100g	http://www.bidepharmatech.com/en/product/detail/BD81634.html
Gute Chemie- abcr 3,4,9,10-Perylenetetracarboxylic diimide	European company with sale to the USA 95% €94.50/25g	http://www.abcr.de/shop/en/3-4-9-10-Perylenetetracarboxylic-diimide-95-91982.html/
Luminescence Technology Corp. PTCDI	Taiwan >99%	http://www.lumtec.com.tw/portal_c1_cnt_page.php?owner_num=c1_290785&button_num=c1&folder_id=32167&cnt_id=257882&search_field=&search_word=81-33-4&search_field2=&search_word2=&search_field3=&search_word3=&bool1=&bool2=&search_type=1&up_page=1

Product	Description and price	References
2Datbiochem 3,4,9,10-Perylenetetracarboxylic Diimide	China; Have to request inquiry 97% minimum	http://www.daybiochem.com/Product1/showproduct.php?id=16841&lang=en
APIChem Technology 3,4,9,10-Perylenetetracarboxylic acid diimide	China 5g 25g 100g	http://chemmol.com/chemmol/suppliers/apichemistry/texts.php
MP Biomedicals, LLC PERYLENE-3,4,9,10-TETRACARBOXYLIC DIIMIDE	International with HQ in USA $39.60/1g 5g and 10g Have to request Inquiry	http://www.mpbio.com/product.php?pid=05216511 MSDS Available
Tetra hedron 3,4,9,10-Perylenetetracarboxylic diimide	China Have to request inquiry	http://www.thsci.com/TS02525.html
AHH Chemical 3,4,9,10-Perylenetetracarboxylic diimide	China 98% $435/500g	http://www.ahhchemical.com/product/MT-20875.html MSDS Available
iChemical In 3,4,9,10-Perylenetetracarboxylic diimide	Korean company with sale in USA 98% $71.28/25g	http://www.ichemical.com/chemicals/cas-81-33-4
Biosynth Chemistry and Biology Perylene-3,4:9,10-tetracarboxydiimide	Switzerland, Slovak Republic and USA Have to request quote	https://www.biosynth.com/en/products/life-science/dyes-stains-indicators-labels/products/W-109285.html
InterBioScreen Ltd. 7,18-diazaheptacyclo[14.6.2.2^{2},^{5}.0^{3},^{12}.0^{4},^{9}.0^{13},^{23}.0^{20},^{24}]hexacosa-1(22),2(26),3,5(25),9,11,13,15,20,23-decaene-6,8,17,19-tetrone	Russia company with sale in USA 92-95% $140 S&H $40/3umol $44/5umol $75/10umol	https://www.molport.com/shop/molecule-link/MolPort-001-814-872
Vitas-M Laboratory, Ltd. 7,18-diazaheptacyclo[14.6.2.2^{2},^{5}.0^{3},^{12}.0^{4},^{9}.0^{13},^{23}.0^{20},^{24}]hexacosa-1(22),2(26),3,5(25),9,11,13,15,20,23-decaene-6,8,17,19-tetrone	Hong Kong with sale in USA >90% $65 S&H $26.50/1mg $28/2mg $31/3mg	https://www.molport.com/shop/molecule-link/MolPort-001-814-872
Fluorchem 7,18-diazaheptacyclo[14.6.2.2^{2},^{5}.0^{3},^{12}.0^{4},^{9}.0^{13},^{23}.0^{20},^{24}]hexacosa-1(22),2(26),3,5(25),9,11,13,15,20,23-decaene-6,8,17,19-tetrone 3,4,9,10-PERYLENETETRACARBOXYLIC ACID DIIMIDE	United Kingdom company with sale in USA 98% $95 S&H $12.80/1g $24.32/25g $74.24/100g	https://www.molport.com/shop/molecule-link/MolPort-001-814-872 http://www.fluorochem.co.uk/Products/Product?code=468673 MSDS Available
Alibaba Polyketone pigment chip-C.I. Pigment Violet 29, Mauve	China $8-18/kilogram	https://www.alibaba.com/product-detail/Polyketone-pigment-chip-C-I-Pigment_553396785.html
QINGDAO SANHUAN COLORCHEM CO., LTD. Fast Bordeaux B	China Have to make inquiry	http://www.cncolorchem.com/product/Fast-Bordeaux-B.html
Hangzhou Aibai Chemical Co., Ltd. Crystal Violet CFA	China $1/kg minimum 100 kg	http://xcolor.en.made-in-china.com/product/YojnlbedwScC/China-Pigment-Violet-27-Pigment-Violet-29.html

Product	Description and price	References
Hangzhou Dimachema Import and Export Co., Ltd. PERYLENE VIOLET DP (PV29)	China Have to make inquiry	http://www.dimachema.com/index.php?c=msg&id=761&
Products sold in USA		
Utrecht Designers Gouache Utrecht Designers' Foundation Gouache Set of Eight, Item 6018	USA Watercolors $49.85	http://images.utrechtart.com/Content/pdf/MSDS/UtrechtDesignersGouache.pdf http://www.utrechtart.com/
Utrecht Designers Gouache Utrecht Artists' Watercolors	USA Watercolors Utrecht Artists' Watercolor Portrait Colors, Set of 12 – $110.29 Utrecht Artists' Watercolor Landscape Set of 12 - $115.49 Utrecht Artists' Watercolor Basic Set of 6 - $51.79 Utrecht Artists' Watercolor Professional Wood Box Set of 18 – $286.28	http://images.utrechtart.com/Content/pdf/MSDS/UtrechtArtistsWatercolors.pdf http://www.utrechtart.com/
Winsor & Newton Professional Water Color Tube, 14ml, Perylene Violet	USA Amazon $16.93 (14ml) Winsor & Newton $21.41 (14ml)	http://www.winsornewton.com/na/shop/water-colour/professional-water-colour http://d4of2brjuv1jo.cloudfront.net/assetfiles/3b66a55d-9f40-4008-af19-ab034c5ef82aSAFETY%20DATA%20SHEET-12251-1-1.pdf https://www.amazon.com/Winsor-Newton-Professional-Perylene-Violet/dp/B0038M1UJW/ref=sr_1_2?ie=UTF8&qid=1481907520&sr=8-2&keywords=pigment+violet+29
Dr. Ph. Martin's Synchromatic Transparent Water Color, 0.5 oz, Violet (29)	USA Amazon $6.73 + 2.75 S&H (0.5oz) Dr. Ph. Martin's $7.90 (0.5oz)	https://www.amazon.com/Dr-Ph-Martins-Synchromatic-Transparent/dp/B009ORFMXA/ref=sr_1_16?ie=UTF8&qid=1481907520&sr=8-16&keywords=pigment+violet+29 https://www.docmartins.com/collections/synchromatic-transparent-bottles/products/synchromatic-transparent-water-color-0-5-oz-29

5. Use

PV29 is a high-performance pigment that is a reddish maroon shade with high tint strength. It is recommended primarily for plastics and solvent industrial coatings applications.

http://www.pigments.com/Products/Organic-Pigments/Violet/1029-Perylene-Violet-29.aspx

PV29 is found in multiple industrial, commercial and consumer products with an array of potential uses such as:

Paint and Coatings

- Tunable laser dye
- High-grade industrial paints
- Solvent industrial coatings applications for packaging
- Arts and crafts
- Powder coatings
- Automotive
- Toner
- Inkjet
- Publication
- Metal decoration paint
- Dyeing of polypropylene and polyamide yarns
- Lacquers
- Varnishes
- Bodywork repair
- Watercolors
- Acrylic paints

Other

- Coloring plastics and rubber
- Odor agents
- Cleaning/washing agents
- Surface treatment
- Absorbents and adsorbents
- Laboratory chemicals
- Pharmaceuticals
- Light-harvesting material
- Transistor
- Molecular switches
- Solar cell
- Optoelectronic device
- Paper
- Architectural
- Polyester fibre
- Adhesion
- Motors, generators, vehicle components
- Sporting goods
- Appliances
- Agricultural equipment
- Oil and gas pipelines

Use at Industrial Sites

PV29 is primarily used as a pigment at industrial sites in the U.S. (CDR 2012)

Commercial Uses

According to information submitted to EPA for the 2012 CDR period, PV29 is used in:

- Plastic and rubber products
- Paints and coating

In EPA's Chemical and Product Categories (CPCat) database, uses described for PV29 include:

- Paints
- Lacquers
- Varnishes
- Motor vehicle paints
- Bodywork repair

(https://actor.epa.gov/cpcat/faces/search.xhtml)

Consumer Uses

Watercolor and acrylic paints for art are the only consumer products that the EPA is aware of at the present time with PV29.

Past and Potential Uses

Current International Uses of PV29:

EPA's Aggregated Computational Toxicity Online Resources (AcTor) database, includes the following international use information:

- Sale maintenance and repair of motor vehicles and motorcycles (Denmark)
- Wholesale retail trade and repair (Denmark)
- Odor agents (Denmark)
- Cleaning/washing agents (Norway and Denmark)
- Surface treatment (Norway and Denmark))
- Absorbents and adsorbents (Denmark)
- Paints lacquers and varnishes (Denmark)
- Laboratory chemicals (Finland)
- Pharmaceuticals (Finland)

(https://actor.epa.gov/actor/chemical.xhtml?casrn=81-33-4)

USEFUL TYPES OF INFORMATION

This document presents a summary of information currently available to EPA on this chemical. To more fully characterize the manufacturing, processing, distribution, disposal, and use of this chemical, and to inform the development of the scoping document for this chemical, EPA is interested in obtaining information on:

- the functional uses for this chemical;
- what types of products contain this chemical;
- which industry sectors use this chemical;
- what volume of the chemical is used;
- which uses have been discontinued or phased out;
- exposure scenarios for this chemical; and
- in which articles this chemical is found.

APPENDIX: SOURCES CONSULTED

- U.S. EPA *Chemical Inventory*
  https://www.epa.gov/tsca-inventory
- U.S. EPA *ChemView*
  https://java.epa.gov/chemview
- TRI P2 information
  https://www.epa.gov/toxics-release-inventory-tri-program/pollution-prevention-p2-and-tri
- U.S. EPA *HPV HC* (access through Chemical Data Access Tool – CDAT)
  https://java.epa.gov/oppt_chemical_search/
- U.S. EPA *HPVIS* and *HPV HC* (access through Chemical Data Access Tool – CDAT)
  https://java.epa.gov/oppt_chemical_search/
- DfE Alternatives Assessments
  https://www.epa.gov/saferchoice/design-environment-alternatives-assessments
- Safer Chemical Ingredients List
  https://www.epa.gov/saferchoice/safer-ingredients
- Green Chemistry awards
  https://www.epa.gov/greenchemistry/presidential-green-chemistry-challenge-winners
- Greener products and services
  https://www.epa.gov/greenerproducts/identify-greener-products-and-services
- Pollution Prevention
  https://www.epa.gov/p2/pollution-prevention-case-studies
  https://www.epa.gov/p2/grant-programs-pollution-prevention#sra
  https://www.epa.gov/p2/pollution-prevention-tools-and-calculators
- U.S. EPA *InertFinder*
  https://iaspub.epa.gov/apex/pesticides/f?p=101:1:
- U.S. EPA *Pesticide Chemical Search*
  https://iaspub.epa.gov/apex/pesticides/f?p=CHEMICALSEARCH:1:0::NO:1::
- U.S. EPA *Endocrine Disruptor Screening Program*
  https://www.epa.gov/ingredients-used-pesticide-products/endocrine-disruptor-screening-program-tier-1-assessments
- U.S. EPA *Hazardous Waste*
  https://www.epa.gov/hw/learn-basics-hazardous-waste#regulations
- U.S. EPA *Superfund chemical data matrix*
  https://www.epa.gov/superfund/superfund-chemical-data-matrix-scdm-query
- U.S. EPA *Hazardous Air Pollutants*
  https://www.epa.gov/haps/initial-list-hazardous-air-pollutants-modifications
- U.S. EPA *Significant New Alternatives Policy (SNAP)*
  https://www.epa.gov/snap
- U.S. EPA *Volatile Organic Compounds*
  https://www.epa.gov/indoor-air-quality-iaq/technical-overview-volatile-organic-compounds#definition
- U.S. EPA *Toxic and priority pollutants under the Clean Water Act*
  https://www.epa.gov/eg/toxic-and-priority-pollutants-under-clean-water-act#toxic

- U.S. EPA *Contaminant Candidate list under the Safe Drinking Water Act*
  https://www.epa.gov/ccl/contaminant-candidate-list-3-ccl-3#chemical-list
- U.S. EPA *IRIS Assessment*
  https://cfpub.epa.gov/ncea/iris2/atoz.cfm
- U.S. EPA *SRS*
  https://iaspub.epa.gov/sor_internet/registry/substreg/searchandretrieve/substancesearch/search.do
- U.S. EPA *Chemical and Product Categories (CPCat) Database*
  https://actor.epa.gov/cpcat/faces/home.xhtml
- U.S. National Library of Medicine *ChemIDplus*
  https://chem.sis.nlm.nih.gov/chemidplus/
- U.S. National Library of Medicine *Hazardous Substance Data Bank (HSBD)*
  https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm
- U.S. Department of Health & Human Services *Household Products Database*
  https://hpd.nlm.nih.gov/index.htm
- OSHA *Chemical Hazards and Toxic Substances*
  https://www.osha.gov/SLTC/hazardoustoxicsubstances/index.html
- NIOSH Workplace Safety and Health Topics *Chemicals*
  http://www.cdc.gov/niosh/topics/chemical.html
- NIOSH *Pocket Guide to Chemical Hazards*
  http://www.cdc.gov/niosh/npg/npgdcas.html
- CPSC *Chemicals*
  http://www.cpsc.gov/en/Research--Statistics/Chemicals/
- CPSC *FHSA*
  https://www.cpsc.gov/Business--Manufacturing/Business-Education/Business-Guidance/FHSA-Requirements/
- Food and Drug Administration *List of Databases*
  http://www.fda.gov/ForIndustry/FDABasicsforIndustry/ucm234631.htm
- NTP (National Toxicology Program) *Substances studied by NTP*
  http://ntpsearch.niehs.nih.gov/?e=True&ContentType=Testing+Status
- Department of Energy *Protective Action Criteria Database*
  http://energy.gov/ehss/protective-action-criteria-pac-aegls-erpgs-teels-rev-29-chemicals-concern-may-2016
- California Department of Toxic Substances Control *Toxics in Products*
  http://www.dtsc.ca.gov/PollutionPrevention/ToxicsInProducts/index.cfm
  http://www.dtsc.ca.gov/SCP/CandidateChemicalsList.cfm
  http://www.dtsc.ca.gov/SCP/WhatIsAPriorityProduct.cfm
- California Office of Environmental Health Hazard Assessment *Proposition 65*
  http://oehha.ca.gov/proposition-65/chemicals
  http://oehha.ca.gov/proposition-65/proposition-65-list
- California Office of Environmental Health Hazard Assessment *Biomonitoring*
  http://biomonitoring.ca.gov/chemicals
- California *permissible exposure limits for chemical contaminants*
  https://www.dir.ca.gov/title8/5155table_ac1.html

- California *hazardous substance list*
  https://www.dir.ca.gov/title8/339.html
- California *Safe Cosmetics Program – list of chemical agents known or suspected to cause cancer or developmental or other reproductive harm.*
  http://www.cdph.ca.gov/programs/cosmetics/Pages/default.aspx
  https://safecosmetics.cdph.ca.gov/search/Default.aspx
- Maine *chemicals of high concern*
  http://www.maine.gov/dep/safechem/highconcern/
- Massachusetts *Toxics Use Reduction Act (TURA) (link includes a link to Higher hazard substances list)*
  http://www.mass.gov/eea/waste-mgnt-recycling/toxics/toxic-use-reduction/toxics-use-reduction-act/
- Massachusetts *Complete list of TURA chemicals*
  http://www.mass.gov/eea/agencies/massdep/toxics/tur/toxics-use-reduction-act-tura-reporting-and-fees.html
- Lowell Center for Sustainable Production *Chemical, Policy and Science Initiative*
  http://www.chemicalspolicy.org/chemicalspolicy.us.state.database.php
- Minnesota Department of Health *Toxic Free Kids Act Chemicals of High Concern*
  http://www.health.state.mn.us/divs/eh/hazardous/topics/toxfreekids/highconcern.html
- Michigan *Environmental Health Topics*
  http://www.michigan.gov/mdhhs/0,5885,7-339-71548_54783_54784_74881-13050--,00.html
- New Hampshire *Regulated Toxic Air Pollutants*
  http://des.nh.gov/organization/commissioner/legal/rules/documents/env-a1400.pdf
- New Jersey *Right to Know Hazardous Substances*
  http://web.doh.state.nj.us/rtkhsfs/rtkhsl.aspx
- Oregon *Priority Persistent Pollutants (in water)*
  http://www.deq.state.or.us/wq/SB737/
- Oregon *Pollutant Profiles*
  http://www.deq.state.or.us/wq/SB737/docs/LegRpAtt420100601.pdf
- Oregon *Reducing Toxics in Oregon*
  http://www.oregon.gov/deq/Pages/ToxicsReduction.aspx
- Oregon *Chemicals of Concern for Children's Health*
  http://public.health.oregon.gov/HealthyEnvironments/HealthyNeighborhoods/ToxicSubstances/Pages/childrens-chemicals-of-concern.aspx
- Pennsylvania Department of Labor and Industry *Hazardous Substance List*
  http://www.pacode.com/secure/data/034/chapter323/chap323toc.html
- Rhode Island *Air Resources – Air Toxics*
  http://www.dem.ri.gov/pubs/regs/regs/air/air22_08.pdf
- Vermont *Chemical Disclosure Program for Children's Products*
  http://www.healthvermont.gov/enviro/chemical/cdp.aspx
- Washington *Chemicals of High Concern to Children*
  http://www.ecy.wa.gov/programs/hwtr/rtt/cspa/chcc.html
- Washington *Children's Safe Products Act*
  http://apps.leg.wa.gov/RCW/default.aspx?cite=70.240

- Washington Department of Labor & Industries *SHARP Publications*
  http://www.lni.wa.gov/Safety/Research/Pubs/default.asp
- National Conference of State Legislatures
  http://www.ncsl.org/research/environment-and-natural-resources/state-chemical-statutes.aspx
- Canada *Chemicals Portal*
  http://chemicalsubstanceschimiques.gc.ca/index-eng.php
- EU *ECHA website*
  https://echa.europa.eu/
- Australia *NICNAS Chemical Information*
  https://www.nicnas.gov.au/chemical-information
- Japan *Chemical Risk Information Platform (CHIRP)*
  http://www.nite.go.jp/en/chem/chrip/chrip_search/systemTop
- OECD *eChemPortal*
  http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en
- Stockholm Convention on Persistent Organic Pollutants
  http://chm.pops.int/TheConvention/ThePOPs/ListingofPOPs/tabid/2509/Default.aspx
  http://chm.pops.int/TheConvention/ThePOPs/ChemicalsProposedforListing/tabid/2510/Default.aspx
- WHO IPCS (UN)
  http://www.who.int/ipcs/en/
- Other – worker protection information
  http://www.dguv.de/ifa/gestis/gestis-internationale-grenzwerte-fuer-chemische-substanzen-limit-values-for-chemical-agents/index-2.jsp
- DeLima Associates *Consumer Product Information Database (CPID)*
  https://www.whatsinproducts.com/chemicals/index/1
- SRC *FatePointers Search Module PHYSPROP*
  http://esc.syrres.com/fatepointer/search.asp
- Product and company websites