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# Guidance on information requirements and chemical safety assessment

## Chapter R.3: Information gathering

Version 1.1

December 2011

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***Guidance on information requirements and chemical safety assessment***
***Chapter R.3: Information gathering***

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# PREFACE

This document describes the information requirements under REACH with regard to substance properties, exposure, use and risk management measures, and the chemical safety assessment. It is part of a series of guidance documents that are aimed to help all stakeholders with their preparation for fulfilling their obligations under the REACH regulation. These documents cover detailed guidance for a range of essential REACH processes as well as for some specific scientific and/or technical methods that industry or authorities need to make use of under REACH.

The guidance documents were drafted and discussed within the REACH Implementation Projects (RIPs) led by the European Commission services, involving stakeholders from Member States, industry and non-governmental organisations. These guidance documents can be obtained via the website of the European Chemicals Agency (http://echa.europa.eu/reach_en.asp). Further guidance documents will be published on this website when they are finalised or updated.

This document relates to the REACH Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006.[1]

1 Corrigendum to Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC (OJ L 396, 30.12.2006); amended by amended by: Council Regulation (EC) No 1354/2007 of 15 November 2007 adapting Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), by reason of the accession of Bulgaria and Romania, Commission Regulation (EC) No 987/2008 of 8 October 2008 as regards Annexes IV and V; Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures; Commission regulation No 453/2010 of 20 May 2010 as regards Annex II; Commission Regulation No 252/2011 of 15 March 2011 as regards Annex I; Commission Regulation No 366/2011 of 14 April as regards Annex XVII (Acrylamide), Commission Regulation No 494/2011 of 20 May 2011, as regards Annex XVII (Cadmium).

**DOCUMENT HISTORY**

| **Version** | **Comment** | **Date** |
|---|---|---|
| Version 1 | First edition | May 2008 |
| Version 1.1 | Corrigendum replacing references to DSD/DPD by CLP references<br><br>Editorial changes | December 2011 |

**Convention for citing the REACH regulation**

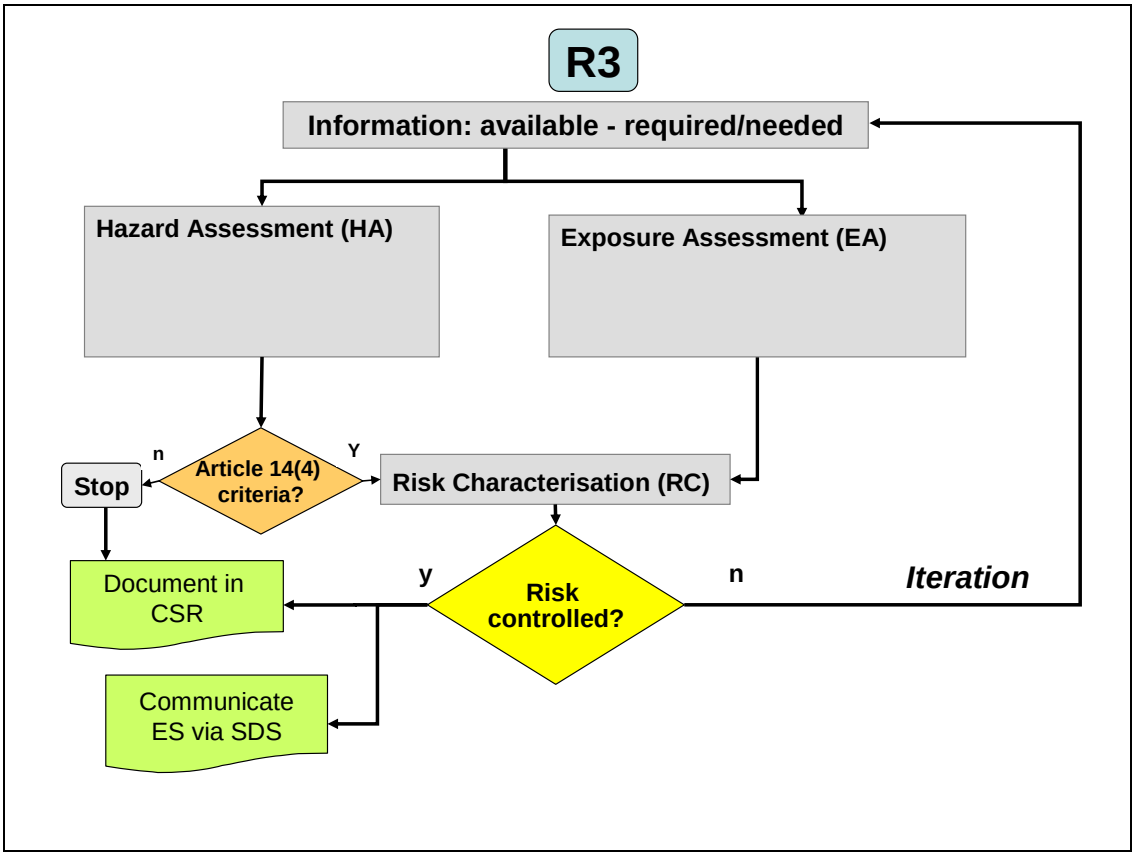
Where the REACH Regulation is cited literally, this is indicated by text in italics between quotes.

**Table of Terms and Abbreviations**

See Chapter R.20

**Pathfinder**

The figure below indicates the scope of part R.3 within the Guidance Document



# TABLE OF CONTENTS

**R.3. INFORMATION GATHERING ..... 1**

**R.3.1 Information sources/searching ..... 1**

**R.3.2 Recording the Search Strategy ..... 3**

**R.3.3 Published Articles on Searching for Health/Hazard Information ..... 5**

**R.3.4 Indicative list of major available databases and databanks ..... 8**

R.3.4.1 No fee sources ..... 8

R.3.4.2 Fee based sources ..... 10

**R.3.5 References for Chapter 3 ..... 14**

# R.3. INFORMATION GATHERING

This Guidance Document has been developed to assist registrants meet the information requirements for their chemicals by considering all types and sources of information and the adequacy and suitability of such data through specific Integrated Testing Strategies (ITS) for each endpoint.

However, before any of these strategies are applied, a critical first step is to assemble all of the available information on a substance, or information that may be useful to inform on the properties of that substance. This information should be used to drive the information gathering strategy detailed and described in subsequent specific chapters and is a vital first step in the overall process. This is envisaged in Step 1 of Annex VI of REACH - *Gather and share existing information* – and is described in Sub-section R.3.1.

The specific information requirements for REACH are detailed in Annexes VI-X of the Regulation and are discussed in detail in the endpoint specific subsections of Chapter R.7.

## R.3.1 Information sources/searching

This section addresses information searching strategies and sources of information, but not the use or quality of the information that this process may yield.

Within the context of the Regulation, information is required for the specific purposes of:

- Classification and Labelling
- Determination of PBT status
- Determination of vPvB status
- Chemical Safety Assessment and Report
- Determination of any need for risk management measures

The above measures provide for:

- Downstream communication of information on the hazards of substances
- Ensuring a high level of protection of human health and the environment, as well as the free circulation of substances on the internal market while enhancing competitiveness and innovation

Failure to collate all of the available information on a substance may lead to duplicate work, wasted time, increased costs and potentially unnecessary animal use. Consequently, a thorough and reliable information gathering stage is a critical first step.

REACH requires the submission of data on:

- Substance identity
- Physico-chemical properties
- Exposure/uses/occurrence and applications
- Mammalian toxicity
- Environmental toxicity

- Environmental fate, including chemical and biotic degradation.

For the description of substance identity see the Guidance for identification and naming of substances under REACH. In many cases the information gathered may consist of actual test data. However, other types of information may be sufficient, especially when used in a *Weight of Evidence* approach. Such information could include:

- Human data
- Data from *in vivo* or *in vitro* studies that have not been generated in accordance with the latest adopted/accepted version of the corresponding (validated) test method or to GLP (or equivalent) standards
- (Q)SAR model outputs[2]
- SAR model outputs, read-across and category approaches

Consequently the information searching strategy needs to be as wide as possible. Guidance is given below on information sources specific to each endpoint and the searcher needs to understand the range of potential sources of information, and their content, structure, design and format. Given the large numbers of available resources and venues, the time required to learn the details of each system can be extensive, leading many searchers to search only a few, familiar resources. However this restricted approach is unlikely to yield all available data/information.

Information source types that could be included in any search strategy comprise (but are not limited to):

- in house Company and trade association files – may include studies generated in-house, commissioned studies carried out by contract houses, information on type and experience in use, reports from downstream companies and customers, purchased reports from other companies, collections of published papers and reviews of published data, and Safety Data Sheets. This kind of information requires expertise to interpret it. For studies not in the public domain there is the requirement to demonstrate legal title to the information in order to protect intellectual property rights of the data owner.
- Databanks and databases of compiled data – the content depends upon the objectives of the hosts/providers (which may change with time). Databanks generally contain limited information from original sources, but usually give little insight into test information quality. Databases and databanks should be seen only as routes to the cited original sources and are often indicative of the amount of published literature on a substance. They usually cover many more chemicals than the product range of any company. Requires expertise in searching numerous systems and in interpreting information.
- Published literature – could include papers reporting original findings (primary papers), review papers, books, monographs, and reports of proceedings, meetings and conferences. Covers many more chemicals than the product range of any company. Requires expertise in both identifying and interpreting information.
- Internet – search engines allow identification of electronic versions of a diverse range of data sources. In addition, websites of various expert organizations and regulatory bodies contain useful information. To obtain the information, registry numbers, chemical names and possible synonyms will need to be used in the search strategy.
- (Q)SAR models – some of these are available without charge and others are a fee based service. These sources are described in the generic section on QSAR and in the specific

[2] Detailed guidance on how to gather non-testing data is provided in Section R.6.1.7

sections for each endpoint. Specialised expertise is required to run models and interpret results. See Section R.6.1 for further guidance on these models and their use.

An indicative list of major available databases and databanks is given in Section R.3.4.

There is a large literature on the subject of literature searching itself. For example see the special edition of the Journal of Toxicology which was devoted to the topic. It is not the intention of this subchapter to detail this area of expertise although a bibliography is included in Section R.3.4 for further information / reading.

The internet is now maturing as a source of information, but the searcher needs to be aware that a variety of sources needs to be checked rather than just a single source, in order to be sure that all relevant external information is retrieved. Many of the most useful external sources of information are fee based services accessed through a data base vendor or specialist service provider. Sources vary in many aspects, including quality, reliability, and accuracy, indexing policy, extent of peer review, the time-spans covered, numbers of chemicals addressed and the extent of detail. Experienced searchers will know which sources have been most useful to them in the past. In some cases, comparative evaluations have been carried out. For example, Wright (2001) has given an overview of selected fee and non-fee databases, along with experience of the quality of service desk assistance.

The data table/summary databases are a source of initial information but the individual databases typically cover only a relatively small number of chemicals and endpoints. Consequently they cannot always be relied upon to be comprehensive so they often need to be supplemented with other databases including bibliographic ones. One strategy is to use initially free web based sources of information to locate information sources, and gauge the amount of data available. If little or no information is found then the more sophisticated sources may be interrogated. Some of these databases are complex and require knowledge of chemistry and chemical nomenclature to get the best from the investment of time and resource required. This is especially true of substructure searches that may be employed to look for information on similar or complementary substances where the information may be extremely useful for SAR relationships or within categories of substances. Consequently it may often be most cost effective to use a specialist information service provider to access all relevant sources with a consistent strategy.

The OECD has developed a web site giving free public access to existing information on existing Chemicals (The Global Portal to Information on Chemical Substances). In a first phase of development, the Portal gives access to many existing assessment reports and datasets – see http://webnet3.oecd.org/eChemPortal/ and can at this stage be queried by CAS No and chemical names. The OECD is investigating the feasibility of the development of a second phase where different databases that share the same data structure would be linked to the portal and thereby allowing the users to query the Portal by both current simple but also very advanced and complex search facilities including search possibilities related to chemical structure and properties. The European Commission and the US-EPA databases for their national/regional chemicals programmes will be linked to this second version of the Portal in a pilot phase. There are plans to extend this to other countries at a later stage.

## R.3.2 Recording the Search Strategy

The exact searching strategy for a particular substance will be dependent on that substance - a proprietary molecule is unlikely to have any information in the public domain whereas for some high production volume substances the available information may be found in comprehensive reviews obtainable from international organisations. Whatever strategy is employed, it is important to record what is done and when. This serves two purposes: as a check on the detail and thoroughness of the search and also, if a search is repeated on a regular basis, it records the time and extent of the previous search. The search strategy should be recorded and there is a specific chapter in IUCLID 5 to record the details of the search that resulted in the information provided in the registration dossier. The major elements to capture in this record include:

- Chemicals names and synonyms used for the search
- In house Company and trade association files
  - Details of the database(s) and coverage
  - Date of search
- Databanks and databases of compiled data
  - Published literature
    - Databank / Database name(s),
    - Calendar Years covered by the database / databank
    - Date of search
- Internet
  - Search engines used
  - Date of search
- Textbooks Consulted
- Other Sources of information
- (Q)SAR models
  - Name of model / Software version / Reference

It is not the purpose of the search strategy record to document the validity of any QSAR model used, this will be done, as necessary, in the specific endpoint description where the QSAR is used.

When a search is done to find analogous substances for the purposed of chemical category formation, or for establishment of Structure Activity Relationships, the approach should be documented in a similar way.

For employment of chemical categories and (Q)SAR models further guidance is given in Sections R.6.1 and R.6.2.

For many high production volume substances there is an extensive literature and they have often been the subject of extensive critical reviews and evaluation for their effect on both health and the environment. These reviews, from regulatory, academic and international organisations are peer reviewed and generally accepted by stakeholders. Where such reviews exist an exhaustive literature search would only reveal significant amounts of data that have already been assessed and information published after the review has been produced.

Such reviews include (illustrative, not exhaustive)

- EU Existing Substance Regulation Risk assessment
- OECD SIDS evaluations
- WHO International Programme on Chemical Safety; e.g. Environmental Health Criteria documents and Concise International Assessment Documents
- WHO International Agency on Cancer - Monographs

- ECETOC Joint assessment of Commodity Chemical reports (JACC)
- National documentation; e.g. UK HSE Documentation for setting occupational exposure standards. BUA reports, US Environmental Protection Agency reports, BG Chemie

Deviations from reviews under EU legislation should be justified (see REACH Annex I paragraph 0.5.).

It would serve little to add to the overall assessment of a substance by revisiting all of the primary information sources cited in such reviews. In such cases these reviews should form the basis of the information collection strategy and help in both the identification of key studies and *Weight of Evidence* approaches. However, attention must be given to establishing the quality of such substance reviews, for example it is expected that it will have undergone a quality assurance procedure such as a peer review process. Furthermore, it would be necessary to determine when the last complete literature assessment was conducted for the specific substance review in order to ensure that no significant information has been published since the review literature search was conducted. As with all information collection strategies, the decision made for selecting a review and any additional information needs to be documented. It will be necessary to consult the primary literature in order to confirm the study outcomes that drive both classification and the Chemical Safety Assessment – see General Decision Making Framework (GDMF) step 3 in Chapter R.2.

## R.3.3 Published Articles on Searching for Health/Hazard Information


1. Doldi, LM; Bratengeyer, E
The web as a free source for scientific information: a comparison with fee-based databases
ONLINE INFORMATION REVIEW, 29 (4): 400-411 2005

2. Wexler, P
The US National Library of Medicine's Toxicology and Environmental Health Information Program
TOXICOLOGY, 198 (1-3): 161-168 MAY 20 2004

3. Voigt, K; Welzl, G
Chemical databases: an overview of selected databases and evaluation methods
ONLINE INFORMATION REVIEW, 26 (3): 172-192 2002

4. Wexler, P
Introduction to special issue (part II) on digital information and tools
TOXICOLOGY, 173 (1-2): 1-1 APR 25 2002

5. Russom, CL
Mining environmental toxicology information: web resources
TOXICOLOGY, 173 (1-2): 75-88 APR 25 2002

6. Patterson, J; Hakkinen, PJB; Wullenweber, AE
Human health risk assessment: selected internet and world wide web resources
TOXICOLOGY, 173 (1-2): 123-143 APR 25 2002

7. Guerbet, M; Guyodo, G
Efficiency of 22 online databases in the search for physico-chemical, toxicological and ecotoxicological information on chemicals
ANNALS OF OCCUPATIONAL HYGIENE, 46 (2): 261-268 MAR 2002

8. Hull, RN; Ferguson, GM; Glaser, JD; et al.
Risk assessment resources on the World-wide Web (WWW)
HUMAN AND ECOLOGICAL RISK ASSESSMENT, 8 (2): 443-457 FEB 2002

9. Wexler, P
Introduction to special issue on digital information and tools
TOXICOLOGY, 157 (1-2): 1-2 JAN 12 2001

10. Wexler, P
TOXNET: An evolving web resource for toxicology and environmental health information
TOXICOLOGY, 157 (1-2): 3-10 JAN 12 2001

11. Poore, LM; King, G; Stefanik, K
Toxicology information resources at the Environmental Protection Agency
TOXICOLOGY, 157 (1-2): 11-23 JAN 12 2001

12. Brinkhuis, RP
Toxicology information from US government agencies
TOXICOLOGY, 157 (1-2): 25-49 JAN 12 2001

13. Stoss, FW
Subnational sources of toxicology information: state, territorial, tribal, county, municipal, and community resources online
TOXICOLOGY, 157 (1-2): 51-65 JAN 12 2001

14. Wright, LL
Searching fee and non-fee toxicology information resources: an overview of selected databases
TOXICOLOGY, 157 (1-2): 89-110 JAN 12 2001

15. Anderson, CA; Copestake, PT; Robinson, L
A specialist toxicity database (TRACE) is more effective than its larger, commercially available counterparts
TOXICOLOGY, 151 (1-3): 37-43 OCT 26 2000

16. Gehanno, JF; Paris, C; Thirion, B; et al.
Assessment of bibliographic databases performance in information retrieval for occupational and environmental toxicology
OCCUPATIONAL AND ENVIRONMENTAL MEDICINE, 55 (8): 562-566 AUG 1998

17. Ludl, H; Schope, K; Mangelsdorf, I
Searching for information on toxicological data of chemical substances in selected bibliographic databases - Selection of essential databases for toxicological researches
CHEMOSPHERE, 32 (5): 867-880 MAR 1996

3 special issues in journal Toxicology devoted to this topic:

**TOXICOLOGY, 157 (1-2): JAN 12 2001, Special Issue on Digital Information and Tools.**

1. Introduction to special issue on digital information and tools • EDITORIAL, Pages 1-2, Philip Wexler
2. TOXNET: An evolving web resource for toxicology and environmental health information • ARTICLE. Pages 3-10, Philip Wexler
3. Toxicology information resources at the Environmental Protection Agency • ARTICLE, Pages 11-23, Linda Miller Poore, Geffry King and Karen Stefanik
4. Toxicology information from US government agencies • ARTICLE, Pages 25-49, Randall P. Brinkhuis
5. Subnational sources of toxicology information: state, territorial, tribal, county, municipal, and community resources online • ARTICLE, Pages 51-65, Frederick W. Stoss
6. Professional Toxicology Societies: Web Based Resources • ARTICLE, Pages 67-76, James P. Kehrer and Jon Mirsalis
7. Toxicology and environmental digital resources from and for citizen groups • ARTICLE, Pages 77-88, Peter Montague and Maria B. Pellerano
8. Searching fee and non-fee toxicology information resources: an overview of selected databases • ARTICLE, Pages 89-110, Larry L. Wright
9. The IOMC organisations: a source of chemical safety information • ARTICLE, Pages 111-119, Fatoumata Keita-Ouane, Linda Durkee, Emmert Clevenstine, Michael Ruse, Zoltan Csizer, Peter Kearns and Achim Halpaap
10. Using internet search engines and library catalogues to locate toxicology information • ARTICLE, Pages 121-139, Laura Dassler Wukovitz
11. Digital toxicology education tools: education, training, case studies, and tutorials • ARTICLE, Pages 141-152, Jonathan F. Sharpe, David L. Eaton and Craig B. Marcus
12. Online resources for news about toxicology and other environmental topics • ARTICLE, Pages 153-164, Jeffrey C. South

**TOXICOLOGY, 173 (1-2): APR 25 2002, Special Issue (Part 2) on Digital Information and Tools.**

1. Introduction to special issue (part II) on digital information and tools • EDITORIAL, Page 1, Philip Wexler

2. Alternatives to animal testing: information resources via the internet and world wide web • ARTICLE, Pages 3-11, P. J. (Bert) Hakkinen and Dianne K. Green
3. Cancer information resources: digital and online sources • ARTICLE, Pages 13-34, Theodore B. Junghans, Imogene F. Sevin, Boris Ionin and Harold Seifried
4. Developmental toxicity: web resources for evaluating risk in humans • ARTICLE, Pages 35-65, Janine E. Polifka and Elaine M. Faustman
5. Web resources for drug toxicity • ARTICLE, Pages 67-74, Grushenka H. I. Wolfgang and Dale E. Johnson
6. Mining environmental toxicology information: web resources • ARTICLE, Pages 75-88, Christine L. Russom
7. Electronic information resources for food toxicology • ARTICLE, Pages 89-96. Carl K. Winter
8. Forensic toxicology: web resources • ARTICLE, Pages 97-102, Bruce A. Goldberger and Aldo Polettini
9. Genetic toxicology: web resources • ARTICLE, Pages 103-121, Robert R. Young
10. Human health risk assessment: selected internet and world wide web resources • ARTICLE, Pages 123-143, Jacqueline Patterson, P. J. (Bert) Hakkinen and Andrea E. Wullenweber
11. RETRACTED: Internet resources for occupational and environmental health professionals • ARTICLE, Pages 145-152, Gary N. Greenberg
12. WEB resources for pesticide toxicology, environmental chemistry, and policy: a utilitarian perspective • ARTICLE, Pages 153-166, Allan S. Felsot
13. Radiation information and resources on-line • ARTICLE, Pages 167-178, B. Busby
14. Internet resources for veterinary toxicologists • ARTICLE, Pages 179-189, Robert H. Poppenga and Wayne Spoo

**TOXICOLOGY, 190 (1-2): AUG 21 2003, Digital Information and Tools, Part 3 – Global Web Resources.**

1. Preface • EDITORIAL, Page 1, P. Wexler
2. On-line sources of toxicological information in Canada • ARTICLE, Pages 3-14, William J. Racz, Donald J. Ecobichon and Marc Baril
3. On-line information sources of toxicology in Finland • ARTICLE, Pages 15-21, Hannu Komulainen
4. Germany: toxicology information on the World Wide Web • ARTICLE, Pages 23-33, Regine Kahl and Herbert Desel
5. Information resources in toxicology—Italy • ARTICLE, Pages 35-54, Paolo Preziosi, Adriana Dracos and Ida Marcello
6. History and current state of toxicology in Russia • ARTICLE, Pages 55-62, B. A. Kurlyandskiy and K. K. Sidorov
7. Online information resources of toxicology in Sweden • ARTICLE, Pages 63-73 , Gunilla Heurgren-Carlström and Elisabeth Malmberg
8. Toxicology digital sources produced and available in the United Kingdom (UK) • ARTICLE, Pages 75-91, Sheila Pantry
9. Global information network on chemicals (GINC) and its Asian component • ARTICLE, Pages 93-103, Tsuguchika Kaminuma and Kotoko Nakata
10. ILO activities in the area of chemical safety • ARTICLE, Pages 105-115, Isaac Obadia
11. The International Union of Toxicology (IUTOX): history and its role in information on toxicology • ARTICLE, Pages 117-124, Jens S. Schou and Christian M. Hodel
12. OECD Environment, Health and Safety Programme: Information on the World Wide Web • ARTICLE, Pages 125-134, Sally de Marcellus
13. UNEP Chemicals' work: breaking the barriers to information access • ARTICLE, Pages 135-139, Fatoumata Keita-Ouane

## R.3.4 Indicative list of major available databases and databanks

### R.3.4.1 No fee sources

| Source | Database | Description |
|---|---|---|
| European Chemicals Bureau (ECB) European Chemical Substances Information System (ESIS) http://esis.jrc.ec.europa.eu/ | | Provides information on chemicals, related to:<br>EINECS (European Inventory of Existing Commercial chemical Substances),<br>ELINCS (European List of Notified Chemical Substances),<br>NLP (No-Longer Polymers),<br>HPVCs (High Production Volume Chemicals) and LPVCs (Low Production Volume Chemicals), including EU Producers/Importers lists,<br>C&L (Classification and Labelling), Risk and Safety Phrases, Danger etc...,<br>IUCLID Chemical Data Sheets, IUCLID Export Files, OECD-IUCLID Export Files, EUSES Export Files,<br>Priority Lists, Risk Assessment process and tracking system in relation to Council Regulation (EEC) 793/93 also known as Existing Substances Regulation (ESR). |
| US National Library of Medicine (NLM), Specialized Information Sources (SIS) | | Provides access to many excellent databases, see individual descriptions below |
| http://sis.nlm.nih.gov/enviro.html | ITER - - International Toxicity Estimates for Risk Assessment | Risk information for over 600 chemicals from authoritative groups worldwide |
| | IRIS - Integrated Risk Information System | Hazard identification and dose-response assessments for over 500 chemicals |
| | HSDB - Hazardous Substances Data Bank | Comprehensive, peer-reviewed toxicological data for over 5,000 chemicals<br>Excerpts from published literature on:<br>Human Health Effects and Emergency Medicine Treatment<br>Animal Toxicity Studies<br>Ecotoxicology Studies<br>Environmental Fate and Exposure<br>Chemical and Physical Properties<br>Chemical Safety and Handling<br>Environmental and Occupational Standards and Regulations<br>Manufacturing and Use Information |

| Source | Database | Description |
|---|---|---|
| | TOXLINE - Toxicology Literature Online | Over three million references from the toxicology literature, including MEDLINE/ PubMed, research in progress, and meeting abstracts |
| | ChemIDplus - Chemical Identification Plus | Dictionary of over 380,000 chemicals (names, synonyms, structures). Includes links to NLM databases and other resources such as ATSDR Medical Management Guidelines and Public Health Statements |
| | ChemIDplus - advanced | Provides structure search and display for over 260,000 chemicals Includes links to NLM databases and other resources |
| | SuperList: | Lists of chemicals of interest to government agencies |
| | CCRIS - Chemical Carcinogenesis Research Information System | Carcinogenicity, mutagenicity, tumour promotion, and tumour inhibition test results for over 9,000 chemicals |
| | DART - Developmental and Reproductive Toxicology Database | Over 200,000 references to teratology, developmental and reproductive toxicology literature |
| | GENE-TOX - Genetic Toxicology Data Bank | Peer-reviewed genetic toxicology test data for over 3,000 chemicals |
| | Haz-Map | Links jobs and hazardous tasks with occupational diseases and their symptoms |
| | LactMed | Database of drugs to which breastfeeding mothers may be exposed. Covers<br>maternal and infant drug levels<br>possible effects on infants<br>alternate drugs to consider |
| | Household Products | Potential health effects of chemicals for over 6000 common household products.<br>Information in the Household Products Database is taken from a variety of publicly available sources, including brand-specific labels and Material Safety Data Sheets (MSDS) prepared by manufacturers |
| | TRI - Toxics Release Inventory | Annual environmental releases on over 600 toxic chemicals by U.S. facilities |
| | TOXMAP | Geographic representation of TRI (US chemical releases) data with links to other TOXNET resources |
| http://sis.nlm.nih.gov/enviro/toxweblinks.html | Toxicology Web Links – evaluated sources of data | |

## R.3.4.2 Fee based sources

Sources of Health and Environmental Hazard Information

| Databases | Available from | File Type | Subjects Covered | Years Included |
|---|---|---|---|---|
| Agricola | Commercial database vendors | Bibliographic, indexed | Agriculture, pesticides, human and environmental health | 1970 - present |
| AMA Journals | Commercial database vendors | Full text | Medicine, occupational medicine | 1982 - present |
| Encompass Literature (previously APILIT – American Petroleum Institute) | Subscribers only, Commercial database vendors, web version | Bibliographic, extensive indexing, CAS RNs | Toxicology, environmental health, risk assessment | 1963 - present |
| Aquaculture | Commercial database vendors | Bibliographic, indexed | Environmental, aquatic toxicology | 1970 - present |
| Aquatic Sciences & Fisheries Abstract | Commercial database vendors | Bibliographic, indexed | Environmental, aquatic toxicology | 1978 - present |
| Biological Abstracts – BIOSIS | Commercial database vendors | Bibliographic, extensive indexing, CAS RNs | All aspects of biology including mammalian, human and environmental toxicology | 1969 - present |
| CAB Abstracts | Commercial database vendors | Bibliographic, indexed | Agriculture, pesticides, human and environmental health | 1972 - present |
| Cancerlit | Commercial database vendors | Bibliographic, extensive indexing, CAS RNs | Primarily human and animal chronic toxicology | 1975 - 2002 |
| Chemical Abstracts | Commercial database vendors | Bibliographic, extensive indexing, CAS RNs | Mammalian, human and environmental toxicology, risk assessment | 1967 - present |
| Chemical Abstracts Registry File | Commercial database vendors | Extensive indexing, original source of CAS RNs | Index of all chemical compounds appearing in the published literature, includes physical/ chemical properties and indicators of amount of literature available | 1967 - present |
| Chemical Carcinogenesis Research Info. Service – CCRIS | Commercial database vendors | Data Tables/ Summaries | Cancer and chronic toxicity studies summarized | |
| Chemical Exposure | Commercial database vendors | Bibliographic, indexed | Human exposures to chemicals and their health effects summarized, small | 1974 - present |

| Databases | Available from | File Type | Subjects Covered | Years Included |
|---|---|---|---|---|
| | | | database | |
| Chemical Information System (CIS) Databases:<br>AQUIRE - Aquatic Information Retrieval<br>CASR - Chemical Activity Status Report<br>CESARS - Chemical Evaluation Search & Retrieval System<br>ENVIROFATE - Environmental Fate<br>GENETOX - Genetic Toxicity<br>GIABS - Gastrointestinal Absorption<br>ISHOW - Info. System for Hazardous Organics in Water<br>OHM/TADS - Oil and Hazardous Materials/ Technical Assistance Data System<br>PHYTOTOX - Terrestrial Plant Tox<br>SANSS - Structure & Nomenclature Search System<br>SUSPECT - Suspect Chemicals Source Book<br>TSCATS - TSCA Submissions - Unpublished Data | Commercial database vendors | Data Tables/ Summaries | Summarized results searchable by endpoint, species, and route of administration. Some very unique databases, such as PHYTOTOX which only covers effects on plants (primarily agriculture related) | Varies |
| Chemlist.<br>Australian Inventory, status through June 1996<br>EINECS , DSL, NDSL status through June 15, 1990<br>EINECS PMNs (European List of Notified Chemical Substances - ELINCS) through March 2005<br>Japanese Existing and New Chemical Substances List<br>(ENCS), status through Sept. 2004<br>Korean Existing Chemicals List (ECL) Inventory through December 2005<br>TSCA Actions, Inventory Status, and PMN's, | Commercial database vendors | Indexed | Indication of hazard based on regulatory lists upon which the material appears, and provides a measure of how much published hazard information is likely to be found. | Varies |

| Databases | Available from | File Type | Subjects Covered | Years Included |
|---|---|---|---|---|
| coverage through January 6, 2006<br>Philippines Inventory of Chemicals and Chemical Substances status through 2004<br>Swiss Inventory of Notified New Substances status through 2004 | | | | |
| Dissertation Abstracts | Commercial database vendors | Bibliographic, indexed | All areas of health | 1861 - present |
| EMBASE/Excerpta Medica | Commercial database vendors | Bibliographic, extensive indexing, CAS RNs | Health and environmental related areas | 1974 - present |
| Energy Science & Technology | Commercial database vendors | Bibliographic, indexed | Primarily environmental effects | 1974 – present |
| Engineering Index - Compendex | Commercial database vendors | Bibliographic, extensive indexing, CAS RNs | Environmental engineering (air, water, pollution, solid waste) | 1970 – present |
| Enviroline | Commercial database vendors | | Environmental effects (air, water, solid waste) | 1970 – present |
| Environmental Bibliography | Commercial database vendors | | Environmental effects (air, water, solid waste) | 1974 – present |
| EPA's Integrated Risk Information Service – IRIS | Commercial database vendors | Data Tables/ Summaries | Summary of data used and cancer risk assessment done by the US-EPA | |
| ECB's ESIS – European Chemical Substances Information System | http://esis.jrc.ec.europa.eu/ | Data Tables/ Summaries | Summaries of data submitted to the EU (IUCLID, HPV data) | |
| GEOBASE | Commercial database vendors | Bibliographic, indexed | Environmental effects (air, water, solid waste) | 1980 – present |
| Hazardous Substances Data Bank – HSDB | Commercial database vendors | Data Tables/ Summaries | Summaries of all health aspects including end use exposures/ measured levels in the ambient environment. Excellent database, peer reviewed but only covers a small number of chemicals. | |
| Life Sciences Collection | Commercial database vendors | Bibliographic, indexed | All aspects of health/ hazard information. | 1978 – present |

| Databases | Available from | File Type | Subjects Covered | Years Included |
|---|---|---|---|---|
| JICST - EPlus (Japanese Science & Technology) | Commercial database vendors | Bibliographic, indexed | Some coverage of health/hazard topics | 1985 – present |
| Medline | Commercial database vendors | Bibliographic, extensive indexing, CAS RNs | All aspects of health/ hazard information. | 1960 – present |
| National Technical Information Service – NTIS | Commercial database vendors | Bibliographic, indexed | All aspects of health/ hazard information published by US government. | 1964 –present |
| NIOSH | Commercial database vendors | Bibliographic, indexed | Occupational surveys and other related health information | 1973 – 1998 |
| Oceanic Abstracts | Commercial database vendors | Bibliographic, indexed | Environmental effects | 1964 – present |
| PASCAL | Commercial database vendors | Bibliographic, indexed | All aspects of health/ hazard information focused on European publications | 1973 – present |
| Pollution Abstracts | Commercial database vendors | Bibliographic, indexed | Primarily environmental effects | 1970 – present |
| Registry of Toxic Effects of Chemical Substances – RTECS | Commercial database vendors | Data Tables/ Summaries | Toxicity, environmental data, lowest published toxicity values for each chemical listed | |
| Royal Society of Chemistry Databases:<br>Chemical Hazards in Industry - CHI<br>Laboratory Hazards Bulletin - LHB<br>Chemical Safety NewsBase | Commercial database vendors | Bibliographic, indexed | Toxicity, occupational hazards, exposures | <br>1984 - present<br>1981 - present<br>1981 – present |
| Science Citation Index | Commercial database vendors | Bibliographic, indexed | Toxicology, environmental, risk assessments | 1978 – present |
| TRACE | BIBRA Information Services Ltd | Bibliographic, indexed | Toxicology and Health effects of chemicals | 1963 – present |

## R.3.5 References for Chapter 3

Anderson C., Copestake P. and Robinson L. (2000) - A specialist toxicity database (TRACE) is more effective than its larger, commercially available counterparts. *Toxicology,* **151,** 1-3, 37-43.

Brinkhuis R. (2001) - Toxicology information from US government agencies. *Toxicology,* **157,** 1-2, 25-49.

Busby B. (2002) - Radiation information and resources on-line. *Toxicology,* **173,** 1-2, 167-178.

de Marcellus S. (3003) - OECD Environment, Health and Safety Programme: Information on the World Wide Web. *Toxicology,* **190,** 1-2, 125-134.

Doldi L. and Bratengeyer E. (2005) - The web as a free source for scientific information: a comparison with fee-based databases. *Online information Review,* **29,** 4, 400-411.

Felsot A. (2002) - WEB resources for pesticide toxicology, environmental chemistry, and policy: a utilitarian perspective. *Toxicology,* **173,** 1-2, 153-166.

Gehanno J., Paris C., Thirion B. and et al. (1998) - Assessment of bibliographic databases performance in information retrieval for occupational and environmental toxicology. *Occup Env Medecine,* **55,** 8, 562-566.

Goldberger B. and Polettini A. (2002) - Forensic toxicology: web resources. *Toxicology,* **173,** 1-2, 97-102.

Greenberg G. (2002) - RETRACTED: Internet resources for occupational and environmental health professionals. *Toxicology,* **173,** 1-2, 145-152.

Grushenka H. and Johnson E. (2002) - Web resources for drug toxicity. *Toxicology,* **173,** 1-2, 67-74.

Guerbet M. and Guyodo G. (2002) - Efficiency of 22 online databases in the search for physicochemical, toxicological and ecotoxicological information on chemicals. *Ann of Occupational Hyg,* **46,** 2, 261-268.

Hakkinen P. and Green D. (2002) - Alternatives to animal testing: information resources via the internet and world wide web. *Toxicology,* **173,** 1-2, 3-11.

Heurgren-Carlström G. and Malmberg E. (2003) - Online information resources of toxicology in Sweden. *Toxicology,* **190,** 1-2, 63-73.

Hull R., Ferguson G., Glaser J. and et al. (2002) - Risk assessment resources on the World-wide Web (WWW). *Hum Ecol Risk Assessment,* **8,** 2, 443-457.

Junghans T., Sevin I., Ionin B. and Seifried H. (2002) - Cancer information resources: digital and online sources. *Toxicology,* **173,** 1-2, 13-34.

Kahl R. and Desel H. (2003) - Germany: toxicology information on the World Wide Web. *Toxicology,* **190,** 1-2, 23-33.

Kaminuma T. and Nakata K. (2003) - Global information network on chemicals (GINC) and its Asian component. *Toxicology,* **190,** 1-2, 93-103.

Kehrer J. and Mirsalis J. (2001) - Professional Toxicology Societies: Web Based Resources. *Toxicology,* **157,** 1-2, 67-76.

Keita-Ouane F. (2003) - UNEP Chemicals' work: breaking the barriers to information access. *Toxicology,* **190,** 1-2, 135-139.

Keita-Ouane f., Durkee L., Clevenstine E., Ruse M., Csizer Z., Kearns P. and Halpaap A. (2001) - The IOMC organisations: a source of chemical safety information. *Toxicology,* **157,** 1-2, 111-119.

Komulainen H. (2003) - On-line information sources of toxicology in Finland. *Toxicology,* **190,** 1-2, 15-21.

Kurlyandskiy B. and Sidorov K. (2003) - History and current state of toxicology in Russia. *Toxicology,* **190,** 1-2, 55-62.

Ludl H., Schope K. and Mangelsdorf I. (1996) - Searching for information on toxicological data of chemical substances in selected bibliographic databases - Selection of essential databases for toxicological researches. *Chemosphere,* **32,** 5, 867-880.

Montague P. and Pellerano M. (2001) - Toxicology and environmental digital resources from and for citizen groups. *Toxicology,* **157,** 1-2, 77-88.

Obadia I. (2003) - ILO activities in the area of chemical safety. *Toxicology,* **190,** 1-2, 105-115.

Pantry S. (2003) - Toxicology digital sources produced and available in the United Kingdom (UK). *Toxicology,* **190,** 1-2, 75-91.

Patterson J., Hakkinen P. and Wullenweber A. (2002) - Human health risk assessment: selected internet and world wide web resources. *Toxicology,* **173,** 1-2, 123-143.

Polifka J. and Faustman E. (2002) - Developmental toxicity: web resources for evaluating risk in humans. *Toxicology,* **173,** 1-2, 35-65.

Poore L., King G. and Stefanik K. (2001) - Toxicology information resources at the Environmental Protection Agency. *Toxicology,* **157,** 1-2, 11-23.

Poppenga R. and Spoo W. (2002) - Internet resources for veterinary toxicologists. *Toxicology,* **173,** 1-2, 179-189.

Preziosi P., Dracos A. and Marcello I. (2003) - Information resources in toxicology-Italy. *Toxicology,* **190,** 1-2, 35-54.

Racz W., Ecobichon D. and Baril M. (2003) - On-line sources of toxicological information in Canada. *Toxicology,* **190,** 1-2, 3-14.

Russom C. (2002) - Mining environmental toxicology information: web resources. *Toxicology,* **173,** 1-2, 75-88.

Schou J. and Hodel C. (2003) - The International Union of Toxicology (IUTOX): history and its role in information on toxicology. *Toxicology,* **190,** 1-2, 117-124.

Sharpe J., Eaton D. and Marcus C. (2001) - Digital toxicology education tools: education, training, case studies, and tutorials. *Toxicology,* **157,** 1-2, 141-152.

South J. (2001) - Online resources for news about toxicology and other environmental topics. *Toxicology,* **157,** 1-2, 153-164.

Stoss F. (2001) - Subnational sources of toxicology information: state, territorial, tribal, county, municipal, and community resources online. *Toxicology,* **157,** 1-2, 51-65.

Voigt K. and Welzl G. (2002) - Chemical databases: an overview of selected databases and evaluation methods. *Online information Review,* **26,** 3, 172-192.

Wexler P. (2001a) - Introduction to special issue on digital information and tools. *Toxicology,* **157,** 1-2, 1-2.

Wexler P. (2001b) - TOXNET: An evolving web resource for toxicology and environmental health information. *Toxicology,* **157,** 1-2, 3-10.

Wexler P. (2002) - Introduction to special issue (part II) on digital information and tools. *Toxicology,* **173,** 1-2, 1-1.

Wexler P. (2003) - Digital Information and Tools, Part 3 - Global Web Resources. Preface. *Toxicology,* **190,** 1-2, 1.

Wexler P. (2004) - The US National Library of Medicine's Toxicology and Environmental Health Information Program. *Toxicology,* **198,** 1-3, 161-168.

Winter C. (2002) - Electronic information resources for food toxicology. *Toxicology,* **173,** 1-2, 89-96.

Wright L. (2001) - Searching fee and non-fee toxicology information resources: an overview of selected databases. *Toxicology,* **157,** 1-2, 89-110.

Wukovitz L. (2001) - Using internet search engines and library catalogues to locate toxicology information. *Toxicology,* **157,** 1-2, 121-139.

Young R. (2002) - Genetic toxicology: web resources. *Toxicology,* **173,** 1-2, 103-121.

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