

eLearning Course

The Practical Guide to Ecotoxicology and the Environment

15 information-packed modules that give you a solid understanding of ecotoxicology

www.chemicalwatch.com/ecotox-elearning



Informative, convenient & easy to use

- Hours of valuable training filled with up-to-date regulatory data - helping you master the key points and concepts of ecotoxicology and the environment.
- The course is easy to "pick up where you left off" - enabling you to study at your own pace.
- Runs on PC, Mac, tablet and smartphone - allowing you to study at work, from home or on the go, fitting your training conveniently around your busy schedule.
- No travel required - making it a time-efficient training resource that keeps your and your team's travel commitments and expenses down.

Measurable outcomes

- Self-assessment quiz questions - helping you measure whether you've met the learning objectives for each section of the course, giving instant feedback on your progress.

Appeals to a wide range of learning styles

- 340 professionally-designed pages of content combined with audio explanations and videos - providing a carefully paced course that supports trainees' different learning styles and walks you through the key concepts.
- Extensive glossary of terms - helping you decipher key terminology.
- 15 Course Note handouts - for further reading and to help you revise the material on and offline.

Affordable learning

- Low per-trainee prices and attractive group rates - ensuring you maximise returns on your training budget.

Learning Outcomes - you will be able to

MODULE 1

Introduction to ecotoxicology and the environment

- Describe what is meant by the term ecotoxicology and how it differs to toxicology.
- Describe what is meant by the term "environment" and environmental effect.
- Be able to define the terms individual, population, community, ecosystem, habitat and species.
- Explain why it is important to study ecotoxicology.

MODULE 3

Environmental release

- Explain what is meant by environmental risk assessment and why it is important to undertake such an assessment.

Define the terms risk, hazard and exposure.

- Explain what is meant by the terms hazard identification, hazard characterisation, exposure assessment and risk characterisation.
- Describe the kinds of uncertainty which may be encountered when undertaking an environmental risk assessment.

MODULE 3

Environmental release

- Outline what is meant by the substance lifecycle (production, formulation, use

and disposal) and why it is important to understand this concept.

- Explain what is meant by the term environmental compartments.
- Explain how substances are released into the environment (point and diffuse sources), local and regional environment and spatial and temporal scales.

MODULE 4

Environmental transport and fate

- Explain what is meant by environmental transport and fate.
- Outline the factors which can affect environmental mobility.

MODULE 5

Physico-chemical properties

- Describe and define the important physico-chemical parameters which can be used
- Vapour pressure and volatility
- Water solubility
- Octanol water partition coefficient
- pH
- Hydrolysis
- KOC – adsorption coefficient (soil carbon water partitioning coefficient)

- Fugacity
- Henry's Law Constant

MODULE 6

Aquatic ecotoxicology

- Explain what is meant by the term aquatic ecotoxicology and the importance of the aquatic compartment and why this is used for classification and labelling.
- Explain the key indicators used in assessment and the rationale behind this.
- Define the terms acute and chronic effects, LC50, EC50, NOEC, LOEC.
- Define the term trophic levels, its significance and the test species that are commonly used.

MODULE 7

Aquatic ecotoxicology testing

- Explain the differences between short term and long term testing.
- Explain why vertebrates, invertebrates and green plants are used in the assessment.
- Explain why different exposure systems may be required, what these are and when they are used (static, semi static, flow through).
- Explain the difference between nominal concentration and measured concentration.
- Explain the approach taken to testing in the absence of any usable data for fish.

MODULE 8

Terrestrial toxicity

- Explain what is meant by terrestrial toxicology.
- Explain the importance of soil in relation to the terrestrial ecosystem and how it can become contaminated.
- Explain the importance of assessing potential terrestrial vertebrate and invertebrate toxicity and how they may become exposed to chemicals within this ecosystem.

MODULE 9

Chemical persistence and degradation

- Explain what is meant by persistence and degradation.
- Outline the differences between biotic and abiotic degradation.
- Explain what is meant by aerobic and anaerobic degradation.
- Explain what is meant by primary and ultimate biodegradation.
- Explain what is meant by persistence and how it relates to degradation.
- Explain what is meant by persistent organic pollutant (POP).

MODULE 10

Chemical persistence and degradability assessment

Biotic degradation

- Explain why it is important to assess the potential for a substance to degrade within the environment.
- Outline the types of test and criteria (ready biodegradable, inherent biodegradation).
- Explain what is meant in CLP/GHS by rapid degradability and the criteria for assessment.
- Explain the significance of BOD/COD and theoretical oxygen demand and how these can be used to assess the potential for degradation.
- Explain the function of the wastewater treatment plant/sewage treatment plant and how and when this would be assessed.

Abiotic degradation

- Explain what is meant by the terms hydrolysis, oxidation, reduction and photochemical degradation.
- Outline the methods to measure these effects.

MODULE 11

Bioaccumulation, bioconcentration and biomagnification

- Explain the relationship between degradability and bioaccumulation.
- Explain what is meant by the terms bioconcentration, bioaccumulation, biomagnification and bioconcentration factor.
- Outline the significance of these terms to the ecosystems.
- Explain the significance of indirect exposure to humans – man via the environment.
- Describe the ways in which the potential for bioaccumulation can be assessed (fish and Log K_{OW}).

MODULE 12

PBT & vPvB

- Define the terms PBT and vPvB.
- Explain why PBT / vPvB substances are of concern.
- Explain why under REACH an additional assessment for PBT and vPvB is required.
- Outline the approach taken for the assessment of PBT and vPvB.
- Explain the consequences under REACH for substances classified as PBT and vPvB.

MODULE 13

Alternatives to testing

- Be able to explain what is meant by the terms refinement, reduction and replacement.
- Outline which of the three trophic levels falls under the realms of Directive 2010/63/EU on the protection of animals used for scientific purposes.
- Describe the vertebrate testing approach taken by REACH.
- Explain what is meant by a tiered testing approach with one example.
- Outline the use of the fish embryo test and two of its current limitations.

- Explain what is meant by the threshold approach.
- Outline the current status with regards to use of Qsar models.

MODULE 14

Calculation of predicted no effect concentration (PNEC)

- Be able to define the term PNEC.
- Explain how the PNEC is used.
- Describe the types of PNEC which could be derived.
- Outline the approach for deriving a PNEC.
- Explain why assessment factors need to be used and what they do.
- Explain the approach taken in the assessment of a PNEC (marine) in the absence of marine data.
- Describe an alternative approach which can be used for the derivation of the PNEC (soil and sediment) in the absence of data.
- Outline when a PNEC (oral) might need to be considered.

MODULE 15

Environmental exposure assessment

- Explain why it is important to undertake an environmental exposure assessment.
- Explain why a knowledge of the lifecycle stages is important.
- Define the term release rate and the difference between local and regional emissions.
- Explain the difference between Environmental Release Categories and Specific Environmental Release Categories.
- Explain what is meant by the term environmental fate and the processes involved.
- Define what is meant by predicted effect concentration (PEC).
- Explain what is meant by secondary poisoning and man exposed via the environment.
- Outline the differences between measured and modelling approach for exposure estimates.
- Outline how the results of exposure assessment are used in risk characterisation.

Our Trainees

Built by the same team behind Chemical Watch's first eLearning course "The Beginner's Guide to Toxicology" which helped over 1,000 professionals gain confidence in understanding the adverse effects of chemicals on humans.

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£400

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