

Index

- Abiotic** A process or a substance not associated with living organisms.
- Abiotic transformation** Process in which a substance in the environment is modified by nonbiological mechanisms.
- Analytical approach** Purpose of a chemical analysis that defines technique and analytical method to be applied.
- Analytical matrix** Physical medium in which the analyte is to be sampled and analyzed. A given environmental matrix to be analyzed becomes an analytical matrix.
- Analytical method** Application of an analytical technique for the determination of an analyte in a specific medium or analytical matrix.
- Analytical monitoring** Chemical analysis or set of chemical analyses performed to monitor a given process in the environment, be it chemical, physical, or biological.
- Analytical procedure** Set of technical details for the application of an analytical method in a given sample, considering the sampling stage, the elimination of interferences, and the data validation.
- Analytical process** Set of operations leading to an analytical result.
- Analytical protocol** Set of guidelines detailing the procedures that must be followed in order for the results to be accepted by an agency or regulatory body.
- Analytical technique** Technological strategy for the use of a physical or chemical phenomenon for the identification or quantification of an analyte.
- Analyte** A chemical species of interest in a chemical analysis, which may be organic or inorganic.
- Anthropic activities** Activities developed by the man, as agriculture, industry, commerce, and traffic, among others, with direct effects on the environment.
- Blank of method** Material of known composition, such as distilled water, without the presence of the analyte, handled in the same way as the sample, and used to observe possible contamination resulting from the application of the analytical method.

- Blank of sample** Material of known composition, such as distilled water, without the presence of the analyte, handled in the same way as the sample, and used to observe possible contaminations arising from the sampling step.
- Calibration curve or analytical curve** Graphical display of an analyte against the change in the behavior of a property, such as absorption, depending on the variation of its concentration.
- Carcinogenic** Property of a compound, which produces cancer through biochemical changes in cells.
- Chemical analysis** Experimental procedure for the identification or quantification of one or more analytes.
- Chemical species** Chemical entity or particle, as a radical, ion, molecule, or atom.
- Chemometrics** A set of statistical tools to be used in experimental planning and in the treatment of analytical data.
- Chemisorption** Adsorption resulting from the formation of chemical bond between the adsorbent and the adsorbate in a monolayer on the surface of the matrix.
- Chemical substance** Matter of constant composition best characterized by entities (molecules, structural formulas, and atoms). Physical properties such as density, refractive index, electrical conductivity, melting points, and boiling characterize such substances.
- Compound** Chemical substance whose molecule is formed by different atoms, which can only be separated by means of a chemical reaction.
- Contamination** Influence on an analytical result due to the presence of a certain chemical species, which may be the analyte itself from a source other than that from the sample, or any other chemical species.
- Effect** Event resulting from the presence of a chemical (e.g., molecules, ions) or biological (e.g., bacteria, virus) species in the medium; its extent can be considered on the environment or on human or animal health.
- Effluent** Any liquor or waste material discarded, which are emitted by a source, such as chemical production plants and sewage treatment plants, among others.
- Environmental matrix** Medium where a chemical, physical, or biological process occurs that produces a given effect on the environment. Soil, water (groundwater, surface water, wastewater), air, sediment, and sludge are examples of environmental matrix.
- Environmental impact** Effect caused by the presence of a xenobiotic in the environment. May be positive or negative.
- Exposure** Process by which a substance becomes available for absorption by the target population, organism, organ, tissue or cell, by any route.
- Groundwater** Water contained in the aquifer reservoir.
- Genotoxic** Property of a compound, which produces genetic changes through damage to the structure of deoxyribonucleic acid (DNA).
- Green chemistry** Set of 12 guiding principles, which seek, among other objectives, the reduction of waste generation, the atomic and energy economy, and the use of renewable raw materials.

- Hazardous waste or residue** Property of a particular waste or residue, which may cause potential harm to human and animal health or to the environment.
- Humic substances** Chemical substances of complex structure formed through chemical and biological processes of degradation of organic matter; are classified as humic acids (soluble in basic medium), fulvic acids (soluble under any condition of the medium), and humin (insoluble under any condition of the medium).
- In loco** Analysis of a chemical species, organic or inorganic, at its site of origin.
- In situ** Analysis of a chemical species, organic or inorganic, at the time of its formation in the environmental matrix.
- Isotherm** Mathematical model that expresses the relation of equilibrium between the concentration of a component of the sample in the stationary phase (C_s) and its concentration present in the mobile phase (C_M), expressed as $C_s = kC_M$. The partition constant is k .
- Limit of detection (LOD)** It is the lowest concentration or amount that can be detected with reasonable certainty for a given analytical procedure.
- Limit of quantification (LOQ)** It is the lowest concentration or quantity that can be quantified with reasonable certainty for a given analytical procedure.
- Mutagenic** Property of a particular compound, which produces physical defects through changes in the structure of deoxyribonucleic acid (DNA).
- Operation** Technical procedure component of an analytical process or chemical analysis.
- Organic matter** Compositional fraction of an environmental matrix formed by residues of biological origin (plants and animals) under physical, chemical, or biological decomposition processes. It is rich in carbon, nitrogen, hydrogen, oxygen, and sulfur.
- Physiosorption** Adsorption in which the forces involved are intermolecular (van der Waals forces), similar to those responsible for the imperfection of the real gases and the condensation of the vapors. Does not cause changes in the electronic orbital involved.
- Pollutant** A gaseous, liquid, or solid chemical, which has been introduced into the environment by human activity or by natural processes in sufficient concentration to produce measurable effects on humans, animals, vegetation, or materials.
- Pollution** Presence of chemical species in the atmosphere, water, or soil, resulting from human activity or natural processes, in a concentration sufficient to interfere with the comfort, health, or well-being of people or the environment.
- Quantitative structure–activity relationships (QSAR)** The building of structure–biological activity mathematical models by using regression analysis applying physicochemical constants. Activity should be understood as reactivity or molecular interaction.
- Reliability** Confidence level expressed by an analytical result.
- Residue** Any substance or mixture of chemicals present in an environmental matrix resulting from the use of a given chemical substance including its derivatives from degradation and conversion processes.

- Risk** Probability of occurrence of adverse effects caused under specific circumstances by an agent (chemical, physical, or biological) in an organism, population, or ecological system.
- Risk assessment**¹ Identification and quantification of the **risk** resulting from a specific use or occurrence of an agent (i.e., chemical, physical, or biological), taking into account possible harmful effects on individuals exposed to the agent in the amount and manner proposed and all the possible routes of **exposure**.
- Routes of Exposure** Routes by which a substance can enter the body. There are four routes: inhalation, skin (or eye) absorption, ingestion, and injection.
- Sample** Representative physical portion to be analyzed, formed by matrix and analyte. May be solid, liquid, or gaseous, or a combination thereof.
- Sampling plan** A detailed outline of which measurements will be taken at what times, on which material, in what manner, and by whom.
- Surface water** Water contained in lakes, rivers, seas, and oceans.
- Surrogate** A compound similar in chemical composition to the analyte of interest and spiked into environmental samples prior to preparation and analysis. They are used to evaluate extraction efficiency and matrix interference.
- Sustainability** Measurement of the environmental, social, and economic impacts of a given process or product.
- Toxicity** Ability to cause internal damage to a living organism, defined by reference to the amount of the substance administered or absorbed. Can also be considered as the measure of the incompatibility of a substance with life.
- Traceability** Property of a result or measure by which it can be reported to an appropriate national or international standard through an uninterrupted chain of comparisons.
- Xenobiotic** Compound that is foreign to a living organism. Main xenobiotics include drugs, carcinogens, and various compounds that were introduced artificially into the environment.

¹Modified from definition of the International Union of Pure and Applied Chemistry.