GLOSSARY OF TERMS

Abrasion	is a process of grinding, wearing or rubbing away, releasing smaller particles.
Active transport	is the movement of substances against a concentration gradient into the cell requiring energy. It is dependent on a number of chemical and structural properties like molecular shape, volume/size, whether the atomic bonds can rotate, etc.
Adsorption	is the process where molecules or ions adhere to a solid surface. It occurs when substances from a fluid phase accumulate on the surface of a solid material.
Aerobic/ anaerobic	needing oxygen/ not needing oxygen.
Aggregation	refers to the process of particles or molecules coming together to form larger clusters or aggregates.
Anionic	refers to negatively charged ions or anions.
Applicability domain	in terms of structure activity relationship (SAR) or quantitative SAR refers to the response and chemical structure spaces in which the model makes predictions with given reliability. It is determined by assessing the similarity of a new molecule to the training set for the model.
Aqueous dispersion PTFE	a form of polytetrafluoroethylene in which the polymer molecules are dispersed in water.
ASTM	is the American Society for Testing and Materials.
ATR-FTIR	is attenuated total reflectance Fourier transform infrared spectroscopy. It allows for the direct examination of solid or liquid samples without further preparation.

Binding capacity	in chemistry refers to the quantity of ligand or number of ligand molecules that can be bound by a given amount of a particular binding agent or system.
Bioaccumulation	is the gradual absorption and collection of a substance in a person, animal or organism at a faster rate than it can be eliminated.
Bioavailable	in terms of environmental science, it is the amount of a substance that is present in a form that an organism can take up from the environment and be used physiologically.
Biocompatible	the ability of a material to perform with an appropriate host response in a specific application.
Bioconcentration	is a term used in the field of aquatic toxicology to describe the process by which a chemical concentration in an aquatic organism exceeds that in water as a result of exposure to a waterborne chemical.
Biodegradation	is the phenomenon of biological transformation of organic compounds by living organisms, particularly microorganisms.
Biotic/Abiotic Degradation	this refers to transformation or degradation by abiotic (photolysis, hydrolysis, thermal degradation, oxidation) or biotic (aerobic or anaerobic microbial) means.
Cell surface binding/signaling	is the interaction between cell surface receptors and external substances that allow communication between the cell and its environment. The binding of the external molecules can convert extracellular signals into signals within the cell.
Cryogenic milling	is a means of producing smaller particle size by using liquid nitrogen to chill the substance and make it more brittle and susceptible to grinding though a mechanical mill to achieve more effective particle size reduction.
Crystalline/amorphous	in terms of polymer structure, crystalline refers to a hard and brittle state of the polymer versus a molten or rubber-like state of an amorphous polymer.

Desorption	is the process by which a substance is released or removed from a surface where it was previously adsorbed (attached). This can occur via physical, chemical or biological mechanisms, often involving a change in pressure, temperature, or concentration. Desorption is the reverse of adsorption.
DSC	Differential Scanning Calorimeter
Electron capture Detector	is a highly selective detector that is gas chromatography selective to electronegative compounds, especially chlorinated, fluorinated, or brominated molecules. It is sensitive to some of these compounds in the parts per trillion (ppt) range.
Electrostatic interaction	is the force of attraction or repulsion between two charged particles.
Environmental Compartment	refers to air, water, soil, and sediment.
Environmental fate and behavior	refers to the movement, transformation, and persistence of chemicals in different environmental compartments.
Environmental stock	in terms of the proposed EU PFAS restriction of 2023, this is the mass or concentration of PFAS at the local, regional, continental and global scale.
Explanted	in the context of medical devices, when a medical device is removed from a patient it is "explanted" versus its initial introduction into the patient when "implanted".
Extraction	in terms or environmental chemistry, it is a separation process whereby a substance is separated from a matrix.
Fine powder PTFE	is one of the three types of polytetrafluoroethylene, made by emulsion polymerization.

Fluoromonomer	is a reactive fluorinated substance serving as a building block for fluoropolymers, such as tetrafluoroethylene, hexafluoropropylene, perfluoroalkylvinyl ethers.
Fluoropolymer	is a distinct subset of fluorinated polymers, namely, those made by (co) polymerization of olefinic monomers, at least one of which contains F bound to one or both of the olefinic C atoms, to form a carbon only polymer backbone with F atoms directly attached to it, e.g., polytetrafluoroethylene.
Fragmentation	in terms of microplastics refers to the process by which larger plastic items are broken down into smaller particles known as microplastics.
Functional group/reactive functional group	is defined as an atom or associated group of atoms in a chemical substance that is intended or can be reasonably anticipated to undergo facile chemical reaction.
GPC	is gel permeation chromatography.
Granular PTFE	one of the three types of polytetrafluoroethylene. It is produced by breaking down coarse particles of PTFE obtained by suspension polymerization. It is used in compression molding to form stock shapes such as rods, tubes and sheets. It cannot be expanded into membranes like fine powder PTFE.
Granulometry	refers to the measurement of the size distribution of grains or particles.
Homopolymer	is a polymer composed of only one type of monomer.
Inhibitory effects	are seen in a microbial degradation study when the test substance negatively affects the (growth of) microbes responsible for substance biotic breakdown.
ISO	is the abbreviation for the International Standards Organization.

K_{oc}	is the organic carbon-water partition coefficient. It the product of the adsorption-desorption distribution coefficient (Kd) and fraction of organic content (fOC) of sorbent.
Leaching	in chemistry, refers to the process or a solute becoming detached or extracted from its carrier substance by water or a solvent.
Leachables	Chemical substances which migrate out of polymers under intended use conditions. Leachables are in contrast to substances which are forced out of a polymer by extraction with strong solvents, high temperatures or special analytical techniques and/or heat or extreme conditions, which are known as "extractables".
Lipinski's Rule of Five	is a rule proposed by Christopher A Lipinski, which indicates that poor absorption is more likely to occur when there are more than 5 hydrogen-bond donors, 10 (5×2) hydrogen-bond acceptors, a molecular weight greater than 500 (5×100), and a calculated Log P (cLogP) greater than 5.
Liquid scintillation Counting	is the measurement of radioactive activity of a sample material which uses the technique of mixing the active material with a liquid scintillator and counting the resultant photon emissions.
Long range transport potential	refers to the atmospheric transport or air pollutants within a moving mass of air or distances greater than 100 km
LOQ	is the lowest amount of an analyte in a sample which can be quantitatively determined with suitable precision and accuracy.
Mass balance	involves tracking the flow of materials into and out of a system to ensure that mass remains conserved. I can be used as a quality measure of the extraction efficiency.
Mass-to-charge ratio	in chromatography refers to the ration of the mass of a species to its charge It is used to distinguish between and quantify ions with different masses and charges, allowing for the study of their reactivity without interference from other compounds. The m/z ratio is calculated by dividing the mass

	of an ion by its charge and is expressed in a unified atomic mass units (u) per electric charge (e).
Matrix/matrices/medium/ environmental compartment	refers to air, soil, water or sediment.
Microbial activity	the processes by which microbes (tiny living organisms such as bacteria) cause chemical and biological changes in soils, cells, etc.
Microparticle	is a particle less than 5 mm in size.
Microplastics	are solid polymer particles less than 5 mm in size in three dimensions and fiber-like particles below 15 mm in length.
Mineralization	in the context of incineration process refers to the controlled combustion of solid, liquid, or gaseous combustible wastes primarily to carbon dioxide and water vapor.
Mobility	refers to the ability of substances to be transported easily in the aqueous environment. A mobile substance, as defined by the EU REACH regulation, has a log Koc less than 3 or less than 2 (very mobile).
Monomer	is a molecule that can be bonded to other identical molecules to form a polymer.
Nanoparticle	is a particle between 1 nm and 100 nm in size.
OECD	or the Organisation for Economic Co-operation and Development, is an international organization that works to establish evidence-based international standards and to find solutions to social, economic and environmental challenges.
Particle size distribution	is the percentage, usually by weight and sometimes by number or count, of particles in each size fraction in a powdered sample.

Partition coefficient	is the ratio of the concentration of a substance in one environmental medium to the concentration in a second environmental medium under constant environmental conditions.
Partitioning	is the movement of a substance between environmental compartments (air, water, soil, sediment).
Passive transport	is a process by which an ion or molecule passes through a cell wall from an area of high concentration to an area of low concentration.
Perfluoroalkyl substance	is a type of non-polymeric PFAS for which all hydrogens on all carbons (except those associated with functional groups) have been replaced by fluorines.
Perfluoropolyether	has oxygen atoms incorporated into the carbon backbone of the fluorinated polymer (e.g., $-CF_2-$, $-CF_2CF_2-$, and possibly $-CF(CF_3)CF_2-$ units are separated by O atoms).
Persistence	refers to the length of time a contaminant remains in the environment.
PFAAs	or perfluoroalkyl acids are a subclass of no-polymeric PFAS. These can be carboxylic or sulfonic acids, "long chain" (8 or more carbons in a carboxylate or 6 or more carbons in a sulfonate), or "short chain".
PFAS	or Perfluoroalkyl and Polyfluoroalkyl substances, are a very diverse group of substances including polymers and non-polymers.
Photodegradation/Photolysis	is a process in which polymers can be decomposed by absorbing energy from light to generate free radicals.
Polyfluoroalkyl substance	is a compound for which all hydrogens on at least one, but not all, carbons have been replaced by fluorines.
Polytetrafluoroethylene	PTFE $-(CF_2CF_2)_n-$

Primary/secondary Microparticle	are those particles manufactured to be less than 5 mm in size (primary), whereas secondary microparticles are the result of environmental weathering and mechanical breakdown of larger pieces.
Quenching	is a term used in the analysis of radiolabelled compounds referring to the blocking of the proton emitted after a beta-particle is picked up by the scintillant.
Radiolabel/radiolabeling	a radiolabel is a radioactive atom which is incorporated into a molecule. Radiolabeling is a technique which incorporates a radiolabel into a molecule so that it can track any chemical or biological activity of the molecule a long as the radiolabel is conserved.
Reactive functional group	is an atom or associated group of atoms in a chemical substance that is intended, or can be reasonably anticipated, to undergo a simple chemical reaction.
Respirometer	a device that measures the rate of consumption of oxygen by a living organism or organic system.
Retention time	is a measure of the time taken for a solute to pass through a chromatography column. It is calculated as the time from injection to detection.
Rotational bond	in chemistry refers to the ability of atoms in a molecule to rotate around a single covalent bond, allowing the molecule to adopt different spatial arrangements or conformations.
SAR/QSAR	is the abbreviation for structure activity relationship or quantitative structure activity relationship. The concept is that the structure of a substance is related to chemical or (toxicological) biological reactivity and other behavioral properties.
SEM	is the abbreviation for scanning electron microscope. A beam of focused relatively low energy electrons act as a probe to scan the surface of the material.

Shear force	is an internal force that is caused by an external force acting perpendicular to the material.
Side-chain fluorinated polymer	is a polymeric PFAS with a variable composition non-fluorinated polymer backbone to which fluorinated side chains (e.g., acrylate, urethane, oxetane) are attached by an ether linkage.
Sonication	is the act of applying ultrasonic energy to agitate particles in a sample.
Sorption	is the process by which a substance (sorbate) is sorbed (adsorbed or absorbed) on or in another substance (sorbent).
Substances of concern	as defined in the October 14, 2020, EU Chemicals Strategy for Sustainability Towards a Toxic-Free Environment, substances of concern are "...chemicals with hazardous properties [that] can cause harm to human health and the environment…; chemicals [that] cause cancers, affect the immune, respiratory, endocrine, reproductive and cardiovascular systems, weaken human resilience and capacity to respond to vaccines and increase vulnerability to diseases."
Surface activity	refers to the properties exhibited by molecules on a surface depending on their interactions on that surface. Surface active substances (surfactants) reduce surface tension by interacting on the surface of liquids or between two liquids or a liquid and a gas or a liquid and a solid.
Surface charge	refers to the accumulation of electric charge on the surface of a material.
Surface tension	is the property of a liquid surface displayed by its acting as if it were a stretched elastic membrane.
(Fluoro)telomers	are polyfluoroalkyl substances produced by the fluorotelomerization process.

Tensile test	is a fundamental materials science and engineering test that involves subjecting a sample to a controlled tension until failure. This process helps determine a material's ultimate tensile strength, breaking strength, maximum elongation, and reduction in area.
T_g	or glass transition temperature is the temperature at which the polymer changes from a brittle, glassy state to a flexible, rubbery state.
Transformation	or degradation is the process by which a parent substance is changed into daughter substances, breakdown or transformation products that could be more, less or equally hazardous as the parent substance. Transformation can occur as a result of exposure to sunlight, water, elevated temperature, microbes, air.
Translocation/uptake by plants	is the movement of water, nutrients, organic compounds from one part of the plant to another through the xylem and phloem. Xylem transports water and some nutrients from the roots to the leaves, while phloem transports sucrose and other nutrients throughout the plant.
Transport	is the movement of a substance through environmental media (air, water, soil, sediment).
Transporter proteins	are proteins in the cell membrane that transport substances across biological membranes into the cell. They can perform facilitated diffusion by creating an opening for a substance to diffuse from an area of high concentration to one of low concentration, or through active transport they can assist the cell expending energy to move a substance against its concentration gradient.
Ultrashort PFCA	are perfluoroalkyl acids (PFAAs) with 2 or 3 carbons [C2–C3].
UNEP Stockholm Convention on Persistent Organic Pollutants	is a global treaty to protect human health and the environment from chemicals that remain intact in the environment for long periods, become widely distributed geographically, accumulate in the fatty tissue of humans and wildlife, and have adverse effects on human health and the environment.

UPLC	Ultra-Performance Liquid Chromatography is an analytical technique used for the separation, identification, and quantification of complex mixtures.
Vapor pressure	is a measure of the pressure exerted by a gas above a liquid in a sealed container. A substance with a very high vapor pressure is more likely to partition to the air as a gas or vapor and to move with the air.
Volatility	Volatility is the likelihood that a liquid or solid will become a gas or vapor. Volatility helps predict the likelihood of a substance partitioning to air if it becomes a gas or vapor, and long-range transport potential of a substance once partitioned in air as a gas or vapor.
Weathering	is an integrative process of degradation of a substance involving all mechanisms: photolysis, oxidative degradation, hydrolysis. Weathering is recognized as a mechanism for generation of some polymer microparticles.

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