Glossary

Anode

The electrode in a fuel cell where electrochemical oxidation of the fuel takes place.

Bilirubin oxidase

A copper-containing enzyme that can electrochemically reduce a oxygen molecule to water molecules. In biology, bilirubin oxidase speeds up one step in the breakdown of haem.

Biofuel

A fuel derived from organic matter produced through recent biological processes, as opposed to a fossil fuel, for which organic matter has been subjected to geological processes over long periods of time.

Biomass

Organic matter coming from living, or recently living, organisms.

Cathode

The electrode in a fuel cell where electrochemical reduction of the oxidant takes place.

Feed

Material that is supplied to a process.

Fermentation

A biological process that converts sugars to alcohols, acids or gases. It occurs, for example, in bacteria and yeast.

Flux

Rate of flow per unit area.

Fuel

A substance which can be used to provide energy.

Fuel cell

An electrochemical device that converts chemical energy into electrical energy

Graphene oxide

A hydrophilic, oxidised form of graphene, comprising a single layer, or a few layers, of sp2 bonded carbon sheets bearing oxygen-containing functional groups.

Hydrophilic

Having a strong affinity for water.

Laccase

A copper-containing enzyme that can electrochemically reduce a oxygen molecule to water molecules. In nature, it can break down lignin, the chemically complex brown component in wood.

Membrane

A thin film which acts as a selective barrier, allowing some things to pass through, but not others.

Nanofiltration

A membrane process in which a membrane with a pore size less than 10 nm is used to separate small solute species from larger solute species.

Organophilic

Having a strong affinity for organic compounds.

Permeate

Material that passes through a membrane.

Pertraction

A membrane process in which a solute is transferred from an aqueous phase to an organic phase via a membrane.

Pervaporation

A membrane process in which the feed is a liquid mixture and the permeate is removed as a vapour, so there is a change of phase on passing through the membrane.

PIM

Acronym for a “polymer of intrinsic microporosity.” A PIM is a polymer which behaves like a microporous material (pore size <2 nm) as a consequence of its rigid, contorted macromolecular structure.

Polymer

A substance composed of large molecules (macromolecules) consisting of repeating units.

Proton Exchange Membrane (PEM)

A thin film that allows protons to pass through while preventing gas and liquids from crossing. Also known as a polymer electrolyte membrane.

Selectivity

A measure of how good a separation is achieved in a separation process. In the simplest case, it may be expressed as the ratio of permeabilities for two components.

Vapour permeation

A membrane process in which there is selective transport of vapours across a membrane.