

## Glossary

**Additives** are substances added in small quantities to improve the quality of a product.

**Autocatalysis** is where the reaction product is also a catalyst for the reaction.

**Bioactive** is having a biological effect.

**Bioceramics** are materials especially developed for medical and dental implants that directly interact with surrounding tissue to support tissue growth. Hydroxyapatite, alumina and zirconia are commonly used.

**Biodegradation** is the gradual breakdown of the material mediated by specific biological activity in vivo.

**Bioglass** is a series of silica-based glasses with a three-dimensional SiO<sub>2</sub> network modified by the incorporation of Na<sub>2</sub>O, CaO, and P<sub>2</sub>O<sub>5</sub>.

**Bioresorbable** is a compound or a device that is totally eliminated or bio-assimilated through natural pathways.

**Block copolymers** are two or more homopolymer subunits (blocks) linked by covalent bonds.

**Chain scission** is a term used in polymer chemistry describing the degradation of a polymer's main chain.

**Critical sized bone defects** are bone defects larger than 2.5 cm that will not heal within a patient's lifetime.

**Foreign body response** is an inflammatory **response** elicited by any material that would not normally be found within the body.

**Gibb's free energy** is a quantity that is used to measure the maximum amount of work done in a thermodynamic system when the temperature and pressure are kept constant.

**Glass transition temperature** is the temperature at which polymer molecules show macromolecular mobility and transition from a rigid state to a flexible state.

**Host response** is lodged by an immunocompetent individual in response to the presence of an antigen.

**Hydrolytic degradation** is the breaking of water-labile bonds of a polymer by water.

**Mechanical degradation** is the breakdown of molecules under the influence of mechanical stress.

**Near-zero order kinetics** is a type of reaction in which the rate of polymer mass loss is constant and independent of the influence of degradation products. This is seen in surface eroding polymers.

**Osteoconduction** is the property of a material to support bone tissue ingrowth.

**Osteoinduction** is the stimulation of osteoprogenitor cells to differentiate into osteoblasts.

**Osteointegration** is the direct structural and functional connection between living bone and the surface of an implant.

**Physiochemical properties** are the intrinsic physical and chemical properties of a substance.

**Reactive oxygen species (ROS)** are a highly reactive and unstable group of molecules derived from molecular oxygen.

**Stoichiometric** refers to the relationship between the quantities of reactants and products before, during, and following chemical reactions.

**Stress shielding** is the reduction in bone density when an implant of higher stiffness than bone supports physiological loads.

**Terminal sterilization** is a process of sterilizing a product in its final container to ensure its sterility until use.

**Thermal degradation** is when a polymer changes its properties under the influence of heat.

**Thermodynamic solubility** is the saturation solubility of a compound at the end of a dissolution process.

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