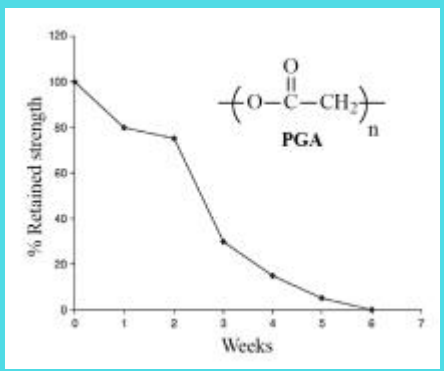
This message contains graphics. If you do not see the graphics, click here to view

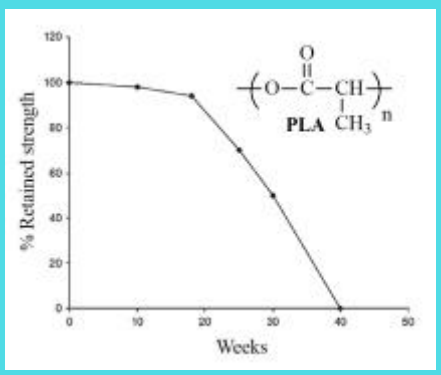
PGA, PLA & PLGA

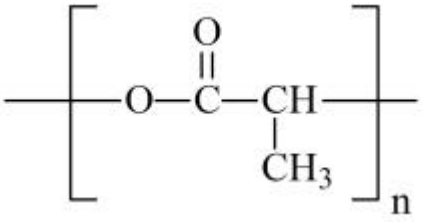
FUNCTIONAL AND BIODEGRADABLE POLYMERS

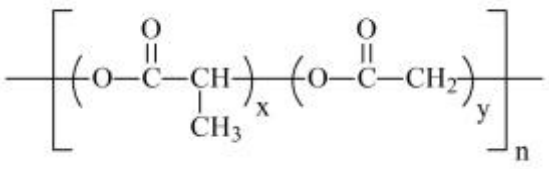
Poly(glycolic acid) PGA is a biodegradable thermoplastic polyester characterized by aliphatic ester bond that are responsible of its hydrolytic instability. Tg of PGA homopolymer range from 35°C and 40°C. The high crystallinity of PGA (45-55%) lead to remarkable mechanical properties (elongation coefficient: 15-35%, elastic modulus: 12.5 GPa). Carbonyl groups of PGA can be cleaved under hydrolytic or enzymatic conditions. PGA is fully biodegraded by the organism within 4 months but its mechanical properties almost disappeared after 6 weeks.

Poly(lactic acid) PLA is a thermoplastic, high-strength, high-modulus polymer. Glass Transition Temperature of PLA homopolymer range from 50°C and 80°C. It has lower crystallinity than PGA (35-40%). Biomedical use of PLA can be limited by its hydrophobicity which is responsible of low water sorption and thus relatively slow hydrolytic degradation. PLA mechanical properties remain quite high during the first months in physiologic conditions. Compared to PGA, 10 months are needed to reach a full biodegradation in the case of PLA.







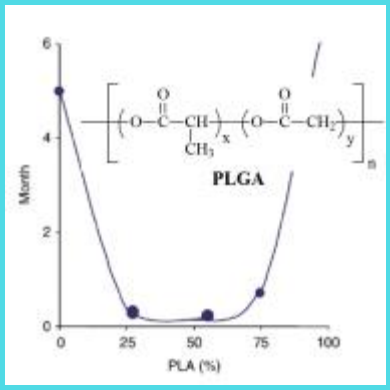


SP-2P-002
Poly(D,L-Lactic Acid)

SP-2P-001
Poly(D,L-Lactic-co-Glycolic Acid)

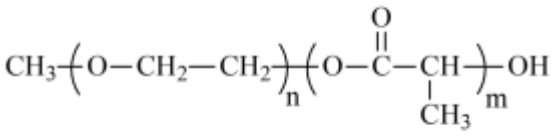
Poly(lactic acid-co-glycolic acid) PLGA. It is possible to tune the degradation parameters and the mechanical properties of these biodegradable polyester by associating both lactic and glycolic units within the same copolymer. The degradation kinetic highly depend on LA/GA ratio. PLGA copolymers will degrade much faster than corresponding homopolymers. Furthermore, mechanical properties of PLGA copolymers can be enhanced by increasing GA content. Finally, a compromise between degradation kinetic and mechanical properties must be reached for each specific application.

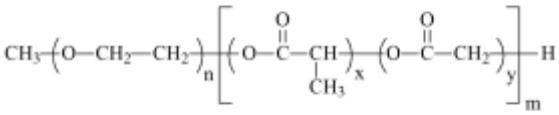
C.Chatard, *Bioresorbable polymers for biomedical applications*, SPECIFIC POLYMERS, 2012



SPECIFIC POLYMERS can synthezise various statistical and block copolymers that combine PLA, PGA or PLGA with other co-monomer (caprolactone, trimethylene carbonate, etc.) or Poly(ethylene glycol) (PEG) chains. Copolymers including biocompatible PEG chains and biodegradable PLA chains are of great interest in drug delivery.

Biodegradable Block Copolymers



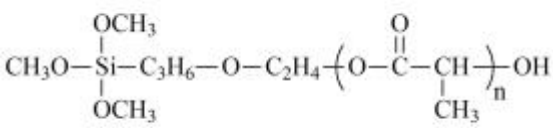


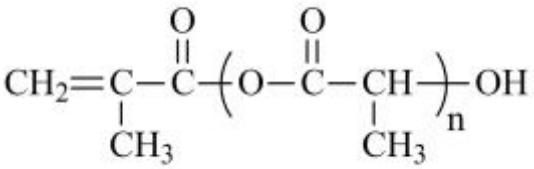
SP-1P2-0-001
PEG-block-PLA

SP-1P-0-002
PEG-block-PLGA

SPECIFIC POLYMERS also perfoms the synthesis of functional PLA, PGA and PLGA. Molecular weight, composition (LA/GA ratio) and functionality can be tuned depending on customer specifications. Biocompatible polyester are of great interest in various biomedical fields such as tissue Engineering, Sutures, Drug delivery, Orthopedic devices, etc.

Functional PLA, PGA & PLGA





SP-2P-2-001
PLA(D,L) Triethoxysilane

SP-2P-7-003
PLA(D,L) methacrylate

Looking a specific polymer for your application ?
SPECIFIC POLYMERS offer CUSTOM SYNTHESIS programs

- SPECIFIC POLYMERS can produce **from grams to hundred grams** depending on the targeted molecule.
- All products are delivered with a **synthesis report** including experimental details and analyses.
- Report on the project progress by **regular phone meeting**
- **Feasibility evaluation** can be proposed depending of customer wishes (targeted structures, quantities)

CONTACT US


CATALOG

SP DESCRIPTION

PUBLICATIONS

SPECIFIC POLYMERS
ZAC Via Domitia
150 Avenue des Cocardières - 34160- Castries - FRANCE
Tel: +33(0) 4 99 74 91 35 Fax: +33(0) 4 99 74 91 52