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## **Supporting Information**

## **Bioelastomers: current state of development**

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Туре	Bioela	istomer	Synthesis	Characteristics	Highlights	Ref
Polyterpenes			Redox emulsion polymerization	Yields from 15- 20%, with molecular weights nearly to 1.5 kDa	Difficult propagation of growing species	35
	Polyocimene	Polyocimene	Coordination polymerization	Use of titanium complexes give high 1,4- <i>trans</i> microstructure at higher temperatures.	Catalytic systems with a temperature- dependent stereoselectivity.	61
			Cationic polymerization	Triflate esters as initiator.	Produce oligoocimenes at high conversion	64
		Ocimene and styrene	Coordination copolymerization	Catalyst based on titanium complexes promote the copolymerization s.	Range of compositions of styrene from 0.23- 0.87.	61
		Polyocimene	Ammonium persulfate and redox-initiated emulsion polymerization	Monomer conversions ranging from 15 to 98% and molecular weights greater than 100 kDa. Tg's from -70 to 58 °C	The redox emulsion polymerization achieves a maximum conversion of 65% but the polymer obtained contains a configuration preferably 1,4	20, 35
			RAFT polymerization	Monomer conversions from 24 to 50% and molecular weights from 2.4 to 9 kDa. Tg's close to -60 °C	The resulting polymer has 1,4- isomer content greater than 90%	49, 50
	Myrcene	Polymyrcene	Coordination polymerization	Titanium complexes form polymers with high 1,4- <i>trans</i> isomer content. The use of Lutenium alkyl complexes promote high 3,4- regioselectivity.	Cis-1,4 content higher than 92% can reach with neodymium catalyst.	54, 55, 57, 59, 60, 61
			Cationic polymerization	Oligomyrcenes obtained with triflate esters as initiator. Use of Lewis acid surfactant combined catalyst (LASC) produce	LASC provides a polymer with predominantly 1,4- units.	64 <i>,</i> 65

**Table S1**. Main bioelastomers based on polyterpenes, polyurethanes and polyesters described in themanuscript and their main characteristics/highlights.

_					
			polymyrcene with		
			M <sub>n</sub> up to 150 <i>kD</i> a.		
		Anionic	Trialkyl aluminum	Polymers with	66,
		polymerization	derivatives and n-	dispersities from	67
			butyllithium have	1.7-2 using trialkyl	
			been used as	aluminum and less	
			initiating systems.	than 1.2 through	
				butyllithium.	
	Poly(myrcene-	Coordination	Range of	Catalyst system	56,
	<i>co</i> -styrene)	copolymerization	compositions	based on lanthanum	61,
			from 0.14-0.9 of	produce a	62
			styrene with	polymyrcene of the	
			titanium catalyst.	copolymer with 1,4-	
				trans microstructure	
				>98%.	
		Cationic	Random	Use of LASC and	65
		copolymerization	copolymers with	able to recover from	
			M <sub>n</sub> from 60-120	the reaction	
			kDa.	mixture.	
		NMP	Poly(myrcene-b-	Changing the molar	46
		copolymerization	styrene) exhibit	feed compositions	
		. ,	T <sub>s</sub> about -70 and	of the monomers is	
			<sup>°</sup> 60°C, brittle	possible to obtain	
			behavior. and	polv(myrcene-stat-	
			better thermal	styrene).	
			stability.	, ,	
	Polystyrene-b-	RAFT	Slightly broad	Potential alternative	51
	poly(β-	copolymerization	dispersity in the	biobased to TPEs as	
	mvrcene)-b-	. ,	triblock	SBS and SIS.	
	polystyrene		copolymer and PS		
			content from 9.8-		
			51.89 wt%.		
		Coordinative	Catalyst system	Use of Lutetium	56,
	Polymyrcene-	copolymerization	based on	catalyst results	58
	со-	. ,	lanthanum	, resulted in random	
	polvisoprene		produce maintain	and block	
	. , .		the 1,4- <i>trans</i>	copolymerization of	
			stereoregularity	myrcene and	
			of the	isoprene.	
			polymerization.		
		Coordinative	Monomodal	The terpolymer	56
	Poly(myrcene-	copolymerization	distributions and	presents high trans-	
	<i>co</i> -isoprene-	. ,	dispersities	1.4-polymyrcene	
	<i>co</i> -styrene)		around 1.5-1.6	content.	
	,,		with lanthanum		
			catalyst.		
		Coordinative	Use of half-	Depend on the	63
	Poly(myrcene-	copolymerization	sandwich	ligands is possible to	
	<i>co</i> -ethvlene)	, ,	scandium	produce diblock	
	,,		complexes.	myrcene-ethvlene.	
			F	multiblock myrcene-	
				, ethylene and	
				alternating	
				mvrcene-ethvlene	
				copolymers.	
		Coordinative	Monomodal	Ethylene facilitates	62
	Polv(stvrene-	copolymerization	molecular weight	the insertion of	
	co-ethylene-		narrow	styrene or B-	
	co-myrcene)		distribution (1.3-	myrcene monomer.	
	,,		1.6) of the	,	
			terpolymers with		
			a lanthanidocene		
			catalyst.		
1			1		

Poly(myceae- co-ptopylene)     copolymerization co-ptopylene, co-ptopylene, co-ptopylene, co-ptopylene, co-ptopylene, co-ptopylene, co-ptopylene, co-ptopylene, co-ptopylene, co-ptopylene, statistical and the molecular gly(diy) methacrylate)     NMP copolymerization polymerization myceae.l2004 copolymerization myceae.l2004 copolymerization polymerisati polymerization polymerization polymerizati polymeriza				Coordinative	High activity	New generation of	63
Polymertation     Coethylene- co-propylene)     Coethylene- co-propylene)     Coethylene- coethylene- methatsouton with half-sandwich stantibuton with half-sandwich stantibuton resulted in a resulted in a copolymerization methacrylate     Copolymerization resulted in a copolymerization resulted in a statistical copolymerization methacrylate     Poly(myrcene- co-isobornyl methacrylate     NMP copolymerization resulted in a copolymerization resulted in a copolymerization resulted in a copolymerization methacrylate     Thermoplastic elsecomerity bio-based raw material to copolymerization replace conventional replace conventrional replace conventional replace conventional r			Poly(myrcene-	copolymerization	unimodal and	myrcene-based	
Polymerization     Copropylene)     NMP     Copolymerization     Copolymerization     Copolymerization     Copolymerization     Polymerization     Polymerization     Polymerization     Polymerization     The copolymerization     Copolymerization     Polymerization     Polymerization     Polymerization     Polymerization     Polymerization     The copolymerization     Copolymerization     Polymerization     Polymerization     Polymerization     Polymerization     Polymerization     Thermoplastic     Polymerization     Polymerizicinal     Polymerizicinal			co-ethylene-	coporymenzation	narrow molecular	ethylene-propylene-	
Polymeria     Corploymeria     Corploymeria <th></th> <td></td> <td>co propylopo)</td> <td></td> <td>woight</td> <td>diono rubbors</td> <td></td>			co propylopo)		woight	diono rubbors	
Polymerization     NMP     Copolymerization     Copolymerization     **       Myrcene and glycidyl methacrylate     NMP     NMP     Copolymerization     **       Myrcene and glycidyl methacrylate     NMP     NMP     Copolymerization     **       Polymyrcene co-isobornyl methacrylate     NMP     Possible gradient     Thermoplastic     **       Polymercene co-isobornyl methacrylate     Copolymerization     Possible gradient     Thermoplastic     **       Polymercene co-isobornyl methacrylate     Copolymerization     Possible gradient     Thermoplastic     **       Polymercene co-isobornyl methacrylate     Copolymerization     NMP     Neodymer with compositions of molar form 0.10-0.90     Thermoplastic     **       Polyfarnesen c     Polyfarnesene co-glycidyl methacrylate     Coordination polymerization     Neodymer     Side chain length polymerization     **       Polyfarnesene co-glycidyl methacrylate     Coordination polymerization     Depend on the incorporates     According to the botalined trans-1,4 or cis.1,4 polyterpenes coris.1 of 1,4 and 3tor.6MA) and polyfarnesene in incorporation of 2.5 to 3.8 mol%     According the methacrylate     **       Polyfarnesene sort-Gramesene)     Coordinative copolymerization<			co-propyletiej		distribution with		
Polyfarnesen s     Polyfarnesen e     Polyfarnesen e     NMP copolymerization glycidyi methacrylate (GMA)     NMP copolymerization polymerization rage from 0.10 to 0.90.     Copolymerization resulted in a statistical copolymer.     4"       Poly(myrcen e-co-isobornyi methacrylate)     NMP copolymerization methacrylate)     NMP copolymerization replace conventional replace convention replace conventional replace conventional replace conv					half candwich	(EPDIVI).	
Polymetrization glycidyl methacrylate)     NMP copolymerization (GMA)     NMP copolymerization glycidyl methacrylate)     Copolymerization resulted in a statistical copolymerization     4"       Poly(myrcene co-isobornyl methacrylate)     NMP (GMA)     NMP razion of GMA incorporated range from 0.10 to 0.90.     Thermoplastic elastomers from orbained econventional     4"       Poly(myrcene co-isobornyl methacrylate)     NMP copolymerization     Thermoplastic razion of GMA incorporated ram material to real compositions of polymerization     Thermoplastic razion of GMA copolymerization     4"       Poly(myrcene) co-isobornyl methacrylate)     Coordinative poly(myrcene)     NMP copolymerization     Thermoplastic razion molar fraction replace conventional     4"       Poly(myrcene) e     Coordinative polymerization     Ned molar inplation polymerization     Vields from 2.0 24% and molacitaria. 24% and molacitarin. 24% andi molacitaria. 24% and molacitaria. 24% and molacitari					nall-Sanuwich		
Polyfarnesen e     Polyfarnesen e     Coordinative (GMA)     NMP copolymerization (GMA)     The copolymerization low dispersity and the molar fraction of GMA incorporated range from 0.10     Copolymerization copolymer.     **       Polyfmyrcene- co-isoboryi methacrylate)     NMP colv(myrcene- co-isoboryi methacrylate)     NMP copolymerization polymerization     MMP methacrylate)     Thermoplastic copolymerization     **       Polyfmyrcene -b-polyfmyrcene -b-polyfmyrcene e     Coordinative -b-polyfmethyl methacrylate)     NMP copolymerization     Neodymium polymerization     Thermoplastic raw material to raw m					scandium		
NMP     The copolymers     Copolymeri					complexes.		47
Polyfarnesen e     Polyfarnesen e     Coordinative polyfarnesen s     NMP     NMP     Possible gradient methacrylate     Thermoplastic copolymer.     49       Polyfmyrcene- co-isobornyl methacrylate     NMP     Possible gradient methacrylate     Thermoplastic copolymerization methacrylate     49       Polyfmyrcene- co-isobornyl methacrylate     Coordinative -b-polyfmyrcenet -b-polyfmyrcenet polyfarnesen e     Coordinative polyfarnesen e     NMP polyfarnesen polymerization     Needymium polar fraction polymerization     Vields from 20- softwart     Vields from 20- softwart     Vields from 20- softwart     Side chain length impacts in the polymerization restact on to 3.2 kDa     35       Polyfarnesen e     Polyfarnesen co-glycidyl methacrylate     Redox emulsion polymerization polymerization     Vields from 20- softwart     Side chain length impacts in the polymerization restact on to 3.2 kDa     35       Polyfarnesen e     Coordinative polyfarnesene co-glycidyl methacrylate     Coordinative polyfarnesene- co-glycidyl methacrylate     Coordinative polyfarnesene- co-glycidyl methacrylate     Side chain length initiator used in the synthesis can catalyst allow the initiator used in the synthesis can consists of 1,4 and polyfarnesene- bolyfarnesene- co-gravene     49       Polyfarnesene co-farnesene)     Coordinative copolymerization     Essentially the microstruture consists of 1,4 and polyfarnesene- co-gravene     49				NMP	The copolymers	Copolymerization	47
Polyfarnesen e     Polyfarnesen e     Polyfarnesen e     Polyfarnesen e     NMP extracrylate (GMA)     Iow dispersity fraction of GMA incorporated range from 0.10 to 0.90.     Thermoplastic elastomer from partially bio-based     **       Polyfmyrcene- co-isobornyl methacrylate)     Coordinative -b-polyfemtyl methacrylate)     Coordinative coplymerization from 0.10-0.90     Thermoplastic elastomer from partially bio-based     **       Polyfmyrcene -b-polyfemtyl methacrylate)     Coordinative coplymerization     Neddymiu from 0.10-0.90     Thermoplastic elastomer from polar vinyl momomer.     **       Polyfarnesen e     Polyfarnesen e     Redox emulsion polymerization     Neddymiu golger vinyl momomer.     Side chain length magacis in the polyrerization polyrerization     **       Polyfarnesen e     Polyfarnesen -co-givdity methacrylate)     NMP polyfarnesen -co-givdity methacrylate)     Depend on the initiator used in the synthesis can be obtained polyfarnesen- stact-GMA) and polyfarnesen- co-farnesene)     6GMA)     Essentially the polymer blends.     **       Polyfarnesen e     Coordinative copolymerization     Lanthanidocene the copolymerization polymerization     Essentially the polymer blends.     **       Polyforpene co-farnesene)     Two-Step polymerization carpolytactide co- coc golytactide co- coc golytactide     Two-Step polymerization the copolymerication copolymerization poperetics.			Myrcene and	copolymerization	obtained have	resulted in a	
Polyfarnesen e     Polyfarnesen e     Polyfarnesen e     Coordinative range from 0.10     Thermoplastic to 0.90. <sup>40</sup> Polyforyrcen- co-isobornyl methacrylate)     Coordinative replace conventional replace conventional replaconventinon replace conventional replace conventional replace con			glycidyl		low dispersity	statistical	
Poly(myrcene- co-isoborny) methacrylate)     NMP copolymerization     Possible gradient myrcene/IBOMA copolymer with compositions of molar fraction from 0.10-0.90     Thermoplastic elastomers from partially bio-based raw material to replace conventional replace conventional     49       Poly(myrcene) -0-poly(myrcene) e     Coordinative ropolymer with methacrylate)     NMP copolymerization     Needymium based catalyst     Versatility to copolymerize myrcene/IBOMA raw material to replace conventional     60       Poly(farresene e     Poly(farresene e     Redox emulsion polymerization     Vields from 20- to 3.2 KDa     Side chain length impacts in the polymerization     35       Poly(farresene e     Poly(farresene -co-glycidy) methacrylate)     NMP copolymerization     Vields from 20- to 3.2 KDa     Side chain length impacts in the polymerization     35       Poly(farresene -co-glycidy) methacrylate)     NMP copolymerization     Depend on the initiator used in the synthesis can be obtained poly(farresene- bc GMA)     Functional groups into macrylate into consists of 1,4 and jopolymerization polymerization consists of 1,4 and incorporation of caprolatone)     40       Poly(styrene- co-farnesene)     Coordinative copolymerization probaresene in the copolymer.     Essentially the mitros runnisciple polymerization incorporation of caprolatone)     40       Poly(styrene- co-farnesene)     Two-Step polymerization proparetis     Poly(styrene- corpolymerization prop			methacrylate		and the molar	copolymer.	
Poly(myrcene: co-isobornyl methacrylate)     NMP copolymerization     Possible gradient range from 0.10 copolymer with copolymer with copolymer with copolymerization     Thermoplastic elastomers from partially bio-based raw material to replace conventional replace conventional from 0.10-0.90     **       Poly(myrcene) -0-poly(methyl methacrylate)     Coordinative copolymerization     Neodymium based catalyst     Versatility to copolymerization     **       Poly(farmesen e     Polyfarnesen e     Polyfarnesen co-cigly(diyl methacrylate)     Redox emulsion polymerization     Yields from 20- 24% and to 3.2 kDa     Side chain length impacts in the polymerization     **       Polyfarnesen e     Polyfarnesene co-cigly(diyl methacrylate)     Redox emulsion polymerization     Yields from 20- 24% and to 3.2 kDa     Side chain length impacts in the polymerization     **       Polyfarnesen e     Coordination polymerization     Iron complexes as catalyst.     According to the ligand can be obtained trans 1.4 or cis.1.4 polyterpenes.     **       Poly(farnesene- co-carnesene)     Coordinative copolymerization     Coordinative copolymerization     Lanthanidocene datalyst allow to comparation of 2.5 to 9.8 mol% of β-farnesene in the copolymer segnent improve the thermal statily tand incomparatibility.     **       Poly(fortreasene- co-farnesene)     Two-Step polymerization process     Poly(faricesene- dacranesene in the copolymerization poly(faricesene- co-f			(GMA)		fraction of GMA		
Poly(myrcene- co-isobornyi methacrylate)     NMP copolymerization methacrylate)     Possible gradient myrcene/IROMA copolymer with omora fraction from 0.10-0.90     Thermoplastic elastomers from partially bio-based raw material to replace conventional replace convention replace conventional replace conventional replace conv					incorporated		
Polymyrcene- co-isobornyl methacrylate)     NMP copolymerization     Thermoplastic elastomers from partially bio-based raw material to replace conventional replace conventional molar fraction     4ª       Poly(myrcene) -b-poly(methyl methacrylate)     Coordinative copolymerization     Needymium based catalyst     Versatility to copolymerize myrcene with a polar vinyl methacrylate)     60       Poly(farmesen e     Polyfarnesen e     Polyfarnesen e     Redox emulsion polymerization     Yields from 20- 24% and molecular weights around to 3.2 k/Do     Side chain length impace with a polyremization     35       Polyfarnesen e     Polyfarnesen e     Polyfarnesen e     NMP     Depend on the into complexes as catalyst.     Side chain length impace with polyfarnesen- catalyst.     35       Polyfarnesen e     Coordination polymerization     Iron complexes as catalyst.     According to the into methacrylate)     36       Polyfarnesene e     Coordination polymerization     Iron complexes as catalyst.     According to the into methacrylate)     36       Polyformer. co-farnesene)     Coordinative copolymerization     Coordinative copolymerization     Iron complexes as catalyst.     According to the obtained trans-1.4 or cit.4     4°       Polyformer. co-farnesene)     Coordinative copolymerization     Coordinative copolymerization     Iron complexes					range from 0.10		
Poly(myrcene- co-isoboryl copolymerization)     NMP     Possible gradient myrcen/BONG     Thermoplastic elastomers from partially bio-based replace conventional from 0.10-0.90     **       Poly(myrcene)     Coordinative copolymerization     Needymium based catalyst     Versatility to copolymerize myrcene (BON)     **       Polyfarnesen e     Polyfarnesen e     Polyfarnesen e     Redox emulsion polymerization     Yields from 20- 24% and to 3.2 kDo     Side chain length impacts in the polymerization     **       Polyfarnesen e     Polyfarnesen e     Polyfarnesen co-glycidyl methacrylate)     NMP polymerization     Vields from 20- 24% and to 3.2 kDo     Side chain length impacts in the polymerization     **       Polyfarnesen c-co-glycidyl methacrylate)     NMP polyfarnesene- co-glycidyl methacrylate)     NMP polyfarnesene- co-firmence     Depend on the initiator used in the synthesis can polyremethacrylate     **       Polyfarnesene co-farmesene     Coordinative copolymerization     Depend on the initiator used in the synthesis can polyrem matrix with fillers or immiscible polymer matrix, with fillers or immiscible polymer matrix, with fillers or immiscible polyremethace, coprolatione     **       Polyfstyrene- co-farmesene co-farmesene     Two-Step polymerization     Display shape caprolation of caprolations if the thermal stability and applications if friend/and polycardability.     **       Succinic					to 0.90.		
Polyfarnesen e     Polyfarnesen e     Polyfarnesen e     Redox emulsion polymerization     Vields from 20- molar fraction infom 0.10-000 molar fraction     Side chain length infom 0.10-000 molar fraction     35       Polyfarnesen e     Polyfarnesen e     Polyfarnesen e     Redox emulsion polymerization     Vields from 20- molar status     Side chain length information     35       Polyfarnesen e     Polyfarnesen e     Polyfarnesen e-co-glycidyl methacrylate)     NMP copolymerization     Vields from 20- molecule     Side chain length infiator used in the synthesis can bobtained trans.1,4 or cis-1,4 or cis-1,4     35       Polyfarnesen e-co-glycidyl methacrylate)     NMP copolymerization     Depend on the initiator used in the synthesis can bobtained trans.1,4 or cis-1,4     56       Polyfarnesene -co-glycidyl methacrylate)     Coordinative copolymerization     Depend on the initiator used in the synthesis can bobtained trans.1,4 or cis-1,4     57       Polyfarnesene- co-farnesenej     Coordinative copolymerization     Lanthanidocene trat-GMA jand polyfarnesene-b- GMA     Essentially the filters or inmiscible polymer blends.     56       Polyfurthame s     Diphenylmethane diisocyanate (MDI) and polyflactide-co- caprolactone)     Two-Step polymerization process     Polyflactide-co- caprolation if mechanical properies.     Site herminally friend/1,4 and applications if mechanical proparediol (PDD), 1,4- trer			Poly(myrcene-	NMP	Possible gradient	Thermoplastic	48
Polyfarnesen e     Polyfarnesen e     Polyfarnesen e     Polyfarnesen Polyfarnesen e     Polyfarnesen Polyfarnesen e     Polyfarnesen Polyfarnesen e     Noff Polyfarnesen e     Noff Polyfarnesen e     Noff Polyfarnesen polyfarnesen e     Noff Polyfarnesen polyfarnesen e     NMP     Depend on the polyfarnesen polyfarnesen polyfarnesen polyfarnesen e     NMP     Depend on the polyfarnesen polyfarnesen polyfarnesen polyfarnesen polyfarnesen e     NMP     Depend on the polyfarnesen polyfarnesen polyfarnesen polyfarnesen polyfarnesen co-glycidyl     Sector farnesen polyfarnesen co-glycidyl     NMP     Depend on the initiator used in the synthesis can be obtained polyfarnesene- coffanation polyfarnesene- coafter polyfarnesen co-glycidyl     Coordinative polymerization     Essentially bio-based polymerize my depart into methacrylate     4°       Polyfarnesen co-farnesenel (MDI) and polyflactide-co- caprolactone)     Coordinative polymerization     Vields from 20- the synthesis can be obtained polyffarnesene-b GMA)     Functional groups into methacrylate     3°       Polyfurthane (MDI) and polyflactide-co- caprolactone)     Coordinative copolymerization     Lanthanidocene the copolymerization     Essentially the incorporation of 2.5 to 9.8 molyf methacrylate     9°       Polyfurthane (SA), fumaric acid (FA), 1,3- propanediol (POD), 1,4- bereak-store acid (SA), fumaric acid (FA), 1,3- propanediol (POD), 1,4- bereak-store acid (FA), 1,3- propanediol (POD), 1,4- bereak-store acid (FA), 1,3- propanediol (POD), 1,4- beroretinit     <			<i>co</i> -isobornyl	copolymerization	myrcene/iBOMA	elastomers from	
Polyfarnesen e     Polyfarnesen e     Polyfarnesen e     NMP copolymerization polymerization     Vields from 2.0- based catalyst     Side chain length impacts in the polymerization reaction     35 copolymerization molar fraction polar vinyl monomer.     60       Polyfarnesen e     Polyfarnesen e     Polyfarnesen polymerization     Redox emulsion polymerization     Vields from 20- 24% and molecular weights around to 3.2 k/00     Side chain length impacts in the polymerization     35 impacts in the polymerization     35 impacts in the polymerization     36 molecular weights around to 3.2 k/00     Side chain length impacts in the polymerization     35 impacts in the polymerization     35 impacts in the polymerization     36 molecular weights around to 3.2 k/00     55 impacts in the polymerization     36 molecular weights around to 3.2 k/00     49 impacts in the polymerization     55 impacts in the polymerization     55 molecular weights around to 3.2 k/00     49 impacts in the polymerization     49 impacts in the polymerization     49 impacts in the polyfarmesen- co-glycidyl methacrylate     49 impact in the polyfarmesen- co-glycidyl methacrylate     5 molecular polyfarmesen- co-glycidyl methacrylate     5 molecular polyfarmesen- bolyfarmesene- bolyfarmesene- bolyfarmesene- bolyfarmesene- co-farmesenei f(MDI) and polyflactide-co- caprolactone)     2 memory and stabilty and stabilty and polyfarmesene importanical propares     62 memory and stabilty and polyfarmesene importanical propares     87 memory and stabilty and polygondensation propare			methacrylate)		copolymer with	partially bio-based	
Poly(myrcene) -b-poly(methyl methacrylate)     Coordinative copolymerization     medar fraction from 0.10-0.90     replace conventional TPEs     ************************************					compositions of	raw material to	
Poly(farnesen e     Poly(farnesen e-o-g)(cidy) methacrylate)     NMP copolymerization     Coordinative copolymerization polymerization     Yields from 20- 24% and molecular based catalyst     Stide chain length impacts in the polymerization     35       Polyfarnesen e     Polyfarnesen e     Polyfarnesen e     Redox emulsion polymerization     Yields from 20- 24% and molecular bights around reaction     Stide chain length impacts in the polymerization     35       Polyfarnesen e     Polyfarnesen e     Redox emulsion polymerization     Yields from 20- 24% and molecular bights around reaction     Stide chain length impacts in the polymerization     35       Polyfarnesen -co-glycidyi methacrylate     NMP     Depend on the initiator used in the synthesis can be obtained polyfarnesene- boglyfarnesene- boglyfarnesene- boglyfarnesene- boglyfarnesene- boglyfarnesene- boglyfarnesene- boglymer tatis     49       Poly(styrene- co-farnesene)     Coordinative copolymerization     Lanthanidocene incorporation of 3,4-polyterpene 2,5 to 3,8 mol/s units.     Essentially the microstructure consists of 1,4 and 3,4-polyterpene 2,5 to 3,8 mol/s units.     52       Poly(styrene- co-farnesene)     Two-Step polymerization process     Poly(starle-co- caprolatone) segment improve the thermal stability and mechanical biomedical field.     57       Succinic acid (SU), sebacic acid (SA), furmaric acid (FA), 1,3- propanediol (PDO), 1,4- biocorpation PDO)     Melt polycondensation polyc					molar fraction	replace conventional	
Poly(myrcene) -b-poly(methyl methacrylate)     Coordinative copolymerization     Neodymium based catalyst     Versatility to copolymerize myrcene with a polar vinyl monomer.     66       Polyfarnesen e     Polyfarnesen e     Polyfarnesen e     Redox emulsion polymerization     Yields from 20- 24% and molecular     Side chain length impacts in the polymerization     35       Polyfarnesen e     Polyfarnesen e     Polyfarnesen co-glycidyl methacrylate     Redox emulsion polymerization     Yields from 20- 24% and molecular     Side chain length impacts in the polymerization     36       Polyfarnesen e-co-glycidyl methacrylate     Coordination polymerization     Iron complexes as catalyst.     According to the ligand can be obtained trans-1,4 or cis-1,4 polyterpenes.     55       Poly(farnesene -co-glycidyl methacrylate)     NMP copolymerization     Depend on the the synthesis can be obtained polyfarnesene- stat-GMA) and polyfarnesene i the copolymer.     Functional groups into methacrylate oright and stability and mechanical polymer blends.     49       Poly(styrene- co-farnesene)     Coordinative copolymerization     Lanthanidocene catalyst allow to produce an incorporation of 2.5 to 9.8 mol% of β-farnesene i the copolymer.     Display shape memory and biocompatibility.     87       Polytartheae (MDI) and poly(lactide-co- caprolactone)     Two-Step polymerization propareties     Display shape memory and biomedical field.					from 0.10-0.90	TPEs	
Polyfarnesen e     Polyfarnesen e     Polyfarnesen e     Polyfarnesen e     Redox emulsion polymerization     Vields from 20- 24% and molecular weights around to 3.2 <i>kDa</i> Side chain length polymerization     35       Polyfarnesen e     Polyfarnesen e     Polyfarnesen e     Redox emulsion polymerization     Iron complexes as catalyst.     According to the ligand can be obtained trans-1,4 or cis-1,4 polyterpenes.     35       Polyfarnesen e     NMP Polyfarnesen -co-glycidyl methacrylate)     NMP Polyfarnesene copolymerization     Depend on the initiator used in polyfarnesene- co-glycidyl methacrylate)     Iron complexes as botained polyfarnesene- co-glycidyl methacrylate     According to the ligand can be obtained polyfarnesene- bolyfarnesene bolyfarnesene in the copolymer.     Essentially the microstructure consists of 1,4 and incorporation of incorporation of intoregradue polyfarnesene in the copolymer.     Sige shape memory and biocompatibility.     **       Polyfarnesene carlouce an (MDI) and polyf(lactide-co- caprolactone)     Two-Step polymerization process     Polyflactide-co- caprolactone     Display shape memory and biocompatibility.     **       Succinic acid (SU), sebacic acid (SA), fumaric acid (FA), 1,3- propaned			Polv(mvrcene)	Coordinative	Neodymium	Versatility to	60
Polyfarnesen e     Polyfarnesen e     Polyfarnesen e     Redox emulsion polymerization     Yields from 20- 24% and molecular weights around to 3.2 kDa     Side chain length impacts in the polymerization     35       Polyfarnesen e     Polyfarnesene e     Polyfarnesene e     Redox emulsion polymerization     Yields from 20- 24% and molecular weights around to 3.2 kDa     Side chain length impacts in the polymerization     35       Polyfarnesene e     Coordination polymerization     Iron complexes as catalyst.     According to the initiator used in the synthesis can be obtained polyfarnesene- co-glycidyl methacrylate)     50       Polyfarnesene -co-glycidyl methacrylate)     NMP copolymerization     Depend on the initiator used in the synthesis can be obtained polyfarnesene-b- GMA)     Functional groups into methacrylate     49       Polyformesene -co-glycidyl methacrylate)     Coordinative copolymerization     Lanthanidocene catalyst allow to produce an incorporation of 3.4-polyterpene units.     Essentially the microstructure consists of 1.4 and 3.4-polyterpene units.     62       Polyformethane disocyanate (MDI) and polyflactide-co- caprolactone)     Two-Step polymerization process     Polyflactide-co- caprolactone     Display shape memory and biocompatibility. Promising applications if biomedical field. properties.     87       Succinic acid (SU), sebacic acid (SA), fumaric acid (FA), 1,3- propanediol (PDO), 1,4- brokx800% and Sothacot the time			-b-polv(methyl	copolymerization	based catalyst	copolymerize	
Polyfamesen e     Polyfamesen e     Polyfamesen e     Redox emulsion polymerization polymerization     Vields from 20- 24% and molecular weights around to 3.2 kDa     Side chain length impacts in the polymerization     35       Polyfarnesen e     Polyfarnesene e     Polyfarnesene polymerization     Redox emulsion polymerization     Iron complexes as catalyst.     Side chain length impacts in the polymerization     According to the ligand can be obtained trans-1,4 or cis-1,4 polyterpenes.     55       Poly(farnesene -co-glycidyl methacrylate)     NMP copolymerization     Depend on the intitator used in the synthesis can be obtained poly(farnesene- sott GfMA) and poly(farnesene- cofarnesene)     Functional groups into methacrylate     46       Poly(styrene- co-farnesene)     Coordinative copolymerization     Lanthanidocene catalyst allow to produce an incorporation of 3,4-polyterpene units.     62       Poly(styrene- co-farnesene)     Two-Step polymerization process     Poly(lactide-co- caprolactone)     Display shape memory and biocompatibility. Promising applications if propanediol (PDO), 1,4- biomedical field. properties.     Poly(lactide-co- caprolactone)     Poly(condensation propanediol (PDO), 1,4- biotegradable TPUs     68			methacrylate)			myrcene with a	
Polyfarnesen e     Polyfarnesen e     Polyfarnesen e     Redox emulsion polymerization     Yields from 20- 24% and molecular weights around to 3.2 kDa     Side chain length impacts in the polymerization     33       Polyfarnesen e     Polyfarnesen e     Coordination polymerization     Yields from 20- 24% and molecular     Side chain length impacts in the polymerization     33       Polyfarnesen -co-glycidyl methacrylate)     Coordination polymerization     Iron complexes as catalyst.     According to the ligand can be obtained trans-1,4 polyterpenes.     53       Polyfarnesen -co-glycidyl methacrylate)     NMP copolymerization     Iron complexes as catalyst.     According to the ligand can be obtained trans-1,4 polyterpenes.     54       Poly(farnesene- -co-glycidyl methacrylate)     Coordinative copolymerization     Iron complexes as catalyst.     According to the ligand can be obtained poly(farnesene- brodymer matrix with fillers or immiscible polymer blends.     49       Poly(styrene- co-farnesene)     Coordinative copolymerization     Lanthanidocene the copolymer.     Essentially the microstructure consists of 1,4 and incorporation of the copolymer.     54       Poly(styrene- co-farnesene)     Two-Step polymerization process     Poly(lactide-co- caprolactone)     Display shape memory and stability and mechanical propanediol (PDO), 1,4- polycondensation properties.     Firendy and biocompatibility. <t< td=""><th></th><td></td><td>meenderylatey</td><td></td><td></td><td>nolar vinvl</td><td></td></t<>			meenderylatey			nolar vinvl	
Polyfarnesen e     Polyfarnesen e     Polyfarnesen e     Redox emulsion polymerization     Yields from 20- 24% and molecular     Side chain length impacts in the polymerization     35       Polyfarnesen e     Polyfarnesen e     Polyfarnesen e     Polyfarnesen polymerization     Iron complexes as catalyst.     According to the ligand can be obtained trans-1,4 or cis-1,4 polyterpenes.     55       Poly(farnesene -corglycidyl methacrylate)     NMP copolymerization     Depend on the initiator used in the sonthesis can be obtained poly(farnesene- stat-GMA) and polyterpenes.     Functional groups into methacrylate can be used to compatibilized the polymer matrix with fillers or immiscible polymer blends.     49       Poly(styrene- co-farnesene)     Coordinative copolymerization     Lanthanidocene incorporation of 2.5 to 3.8 mol% of β-farnesene i the copolymer.     Essentially the memory and stability and polyterpene caprolactone)     62       Poly(urethane s     Diphenylmethane diisocyanate (MDI) and poly(lattide-co- caprolactone)     Two-Step polymerization process     Poly(lattide-co- segment improve the thermal stability and popanediol (PDO), 1,4-     87       Succinic acid (SU), sebacic acid (SA), fumaric acid (FA), 1,3- propanediol (PDO), 1,4-     Melt polycondensation propention     Elongation at propanediol (PDO), 1,4-     89						monomer	
Polyfarnesen e     Polyfarnesen e     Polyfarnesen e     Polyfarnesen e     Polyfarnesen polymerization     Incus fill polymerization polymerization     Incus fill polymerization mates in the polymerization     Socie change mapes in the polymerization       Polyfarnesen e     Polyfarnesen e     Coordination polymerization     Iron complexes as catalyst.     According to the ligand can be obtained trans-1,4 or cis-1,4     55       Poly(farnesene -co-glycidyl methacrylate)     NMP     Depend on the initiator used in the synthesis can be obtained poly(farnesene- boly(farnesene- boly(farnesene- co-farnesene)     Functional groups into methacrylate     49       Poly(styrene- co-farnesene)     Coordinative copolymerization     Lanthanidocene poly(farnesene- boly(farnesene- boly(farnesene- boly(farnesene)     Essentially the microstructure consists of 1,4 and incorporation of 3,4-polyterpene units.     62       Poly(styrene- co-farnesene)     Two-Step polymerization proces     Display shape memory and stability and applications if biomedical field.     87       Succinic acid (SU), sebacic acid (SA), fumaric acid (FA), 1,3- propanediol (PDO), 1,4-     Melt polycondensation proces     Elongation at propanediol (PDO), 1,4-     89				Redax emulsion	Vields from 20-	Side chain length	35
Polyfarnesen e     Polyfarnesen e     Polyfarnesen e     Polyfarnesene e     Polyfarnesene polymerization     Depend on the copolymerization     Impacts in the polymerization to 3.2 kDa     Status polymerization     Status polymerization <th></th> <td></td> <td></td> <td>nolymerization</td> <td>24% and</td> <td>impacts in the</td> <td></td>				nolymerization	24% and	impacts in the	
Polyfarnesen e     Polyfarnesen e     Polyfarnesen e     Polyfarnesen e     Polyfarnesene and polymerization     Indectain weights around to 3.2 kDa     pupyinerization reaction     pupyinerization reaction       Polyfarnesene -co-glycidyl methacrylate)     NMP     Depend on the initiator used in the synthesis can be obtained polyfarnesene- stat-GMA) and polymerization     According to the ligand can be obtained trans-1,4 or cis-1,4 polyterpenes.     49       Polyfarnesene -co-glycidyl methacrylate)     NMP     Depend on the initiator used in the synthesis can be obtained polyfarnesene- stat-GMA) and polymer blends.     49       Polyfarnesene -co-farnesene)     Coordinative copolymerization     Depend on the initiator used in the synthesis can be obtained polyfarnesene- bratic MA)     Functional groups into methacrylate     49       Polyfarnesene -co-farnesene)     Coordinative copolymerization     Coordinative copolymerization     Essentially the microstructure consists of 1,4 and incorporation of 3,4-polyterpene 2,5 to 9,8 mol% units.     62       Polyurethane (MDI) and polyflactide-co- caprolactone)     Two-Step polymerization process     Display shape memory and biccompatibility.     67       Succinic acid (SU), sebacic acid (SA), fumaric acid (FA), 1,3- propanediol (PDO), 1,4-     Melt     Elongation at proparetiol (PDO), 1,4-     Environmentally biodegradable TPUs     89				polymenzation	24/0 allu molocular	nolymorization	
Polynamesen     Polynamesen     Polynamesen     Polynamesen     Polynamesen     Station     According to the ligand can be obtained trans-1,4 or cis-1,4 polyterpenes.     Station of cis-1,4 polyterpenes.     Functional groups into methacrylate     Poly(farnesene corglycidyl methacrylate)     NMP     Depend on the initiator used in the synthesis can be obtained poly(farnesene-scale)     Functional groups into methacrylate     49       Poly(styrene-co-glycidyl methacrylate)     Coordinative copolymerization     Depend on the initiator used in the synthesis can be obtained poly(farnesene-state)     Functional groups into methacrylate     49       Poly(styrene-co-farnesene)     Coordinative copolymerization     Depend on the inicrostructure consists of 1,4 and 3,4-polyterpene     5     6       Poly(styrene-co-farnesene)     Coordinative copolymerization     Catalyst allow to microstructure consists of 1,4 and 3,4-polyterpene     3,4-polyterpene     62       Polyurethane s     Diphenylmethane diisocyanate (MDI) and poly(lactide-co-co-corglactone)     Two-Step polymerization process     Poly(lactide-co-corgloctone)     Display shape memory and biocompatibility. Promising applications if biomedical field. Properties.     87       Succinic acid (SU), sebacic acid (SA), fumaric acid (FA), 1,3- propanediol (PDO), 1,4-     Melt polycondensation 30MPa of tensile     Environmentally biodegradable TPUs     89		Debufarnasan	Delufarnecene		molecular weights around	polymerization	
Poly(styrene- co-farnesene)     Coordination polymerization     Los 3.2 k/b/s     According to the ligand can be obtained trans-1,4 or cis-1,4 polyterpenes.     55       Poly(farnesene -co-glycidyl methacrylate)     NMP     Depend on the initiator used in the synthesis can be obtained poly(farnesene- stat-GMA) and polyterpenes.     Functional groups into methacrylate     49       Poly(styrene- co-farnesene)     Coordinative copolymerization     Depend on the initiator used in the synthesis can be obtained poly(farnesene- stat-GMA) and polyterpenes     Functional groups into methacrylate     49       Poly(styrene- co-farnesene)     Coordinative copolymerization     Lanthanidocene incorporation of 3,4-polyterpene 2.5 to 9.8 mol% units.     Essentially the microstructure consists of 1,4 and 3,4-polyterpene 2.5 to 9.8 mol% units.     52       Polyurethane (MDI) and poly(lactide-co- caprolactone)     Two-Step polymerization process     Poly(lactide-co- caprolactone)     Display shape memory and biocompatibility.     87       Succinic acid (SU), sebacic acid (SA), fumaric acid (FA), 1,3- propanediol (PDO), 1,4- kereinid (SA), fumaric acid (FA), 1,3- propanediol (PDO), 1,4-     Melt polycondensation 30MPa of tensile     Environmentally friendly and biodegradable TPUs     89		Polylamesen	Polylamesene		weights around	reaction	
Poly(farnesene -co-glycidyl methacrylate)   NMP copolymerization   Depend on the initiator used in the synthesis can be obtained poly(farnesene- -co-glycidyl methacrylate)   Functional groups initiator used in the synthesis can be obtained poly(farnesene- star-GMA) and poly(farnesene- be GMA)   Functional groups functional groups   49     Poly(farnesene -co-glycidyl methacrylate)   NMP copolymerization   Depend on the initiator used in the synthesis can be obtained poly(farnesene- GMA)   Functional groups   49     Poly(farnesene -co-glycidyl methacrylate)   Coordinative copolymerization   Depend on the initiator used in the synthesis can be obtained poly(farnesene- GMA)   Functional groups   49     Poly(styrene- co-farnesene)   Coordinative copolymerization   Lanthanidocene catalyst allwo to microstructure consists of 1,4 and incorporation of 3,4-polyterpene units.   Essentially the microstructure consists of 1,4 and incorporation of 3,4-polyterpene units.   62     Poly(lactide-co- caprolactone)   Two-Step polymerization process   Poly(lactide-co- caprolactone)   Display shape memory and biocompatibility.   87     Succinic acid (SU), sebacic acid (SA), fumaric acid (FA), 1,3- propanediol (PDO), 1,4-   Melt polycondensation group and gotthe of training propanediol (PDO), 1,4-   Environmentally friendly and biodegradable TPUs <sup>89</sup>		e		Coordination	lo 3.2 KDU	A according to the	55
Poly(farnesene -co-glycidyl methacrylate)     NMP copolymerization     Depend on the initiator used in the synthesis can be obtained poly(farnesene- stat-GMA) and polymer matrix with poly(farnesene- broly(farnesene- co-farnesene)     NMP copolymerization     Depend on the initiator used in the synthesis can be obtained poly(farnesene- broly(farnesene- broly(farnesene- broly(farnesene- broly(farnesene- co-farnesene)     Functional groups into methacrylate     49       Poly(farnesene -co-glycidyl methacrylate)     NMP     Depend on the initiator used in the synthesis can be obtained poly(farnesene- broly(farnesene- broly(farnesene- broly(farnesene- co-farnesene)     Functional groups into methacrylate     49       Poly(farnesene- co-farnesene)     Coordinative copolymerization     Lanthanidocene incorporation of 3,4-polyterpene units.     Essentially the microstructure or consists of 1,4 and incorporation of 3,4-polyterpene units.     62       Poly(lactide-co- caprolactone)     Two-Step polymerization process     Poly(lactide-co- caprolactone)     Display shape memory and biocompatibility.     87       Succinic acid (SU), sebacic acid (SA), fumaric acid (FA), 1, 3- propanediol (PDO), 1,4-     Melt polycondensation problemestation agroup and biodegradable TPUs     Environmentally friendly and biodegradable TPUs <sup>89</sup>				Coordination	Iron complexes as	According to the	55
Poly(farnesene -co-glycidyl) methacrylate)   NMP copolymerization   Depend on the initiator used in the synthesis can be obtained poly(farnesene- stat-GMA) and polymer matrix with fillers or immiscible polymer blends.   49     Poly(farnesene -co-glycidyl methacrylate)   NMP copolymerization   Depend on the initiator used in the synthesis can be obtained poly(farnesene- ofGMA)   Functional groups into methacrylate   49     Coordinative copolymerization   Coordinative copolymerization   Coordinative copolymerization   Coordinative copolymerization   Essentially the microstructure consists of 1,4 and incorporation of 3,4-polyterpene 2.5 to 9.8 mol%   62     Poly(styrene- co-farnesene)   Two-Step polymerization   Poly(lactide-co- caprolactone)   Display shape polymerization incorporation of segment improve segment improve the thermal stability and mechanical propenties.   Display shape memory and biomedical field.   87     Succinic acid (SU), sebacic acid (SA), fumaric acid (FA), 1,3- propanediol (PDO), 1,4- biotegrid (PDO),				polymerization	catalyst.	ligand can be	
Poly(farnesene -co-glycidyl methacrylate)     NMP copolymerization     Depend on the initiator used in the synthesis can be obtained poly(farnesene-b- GMA)     Functional groups into methacrylate     49       Poly(farnesene -co-glycidyl methacrylate)     NMP     Depend on the initiator used in the synthesis can be obtained poly(farnesene-b- GMA)     Functional groups into methacrylate     49       Poly(styrene- co-farnesene)     Coordinative copolymerization     Lanthanidocene catalyst allow to produce an incorporation of β-farnesene in the copolymer.     Essentially the microstructure polymer blends.     62       Poly(styrene- co-farnesene)     Two-Step polymerization process     Display shape segment improve the thermal stability and proparties.     87       Succinic acid (SU), sebacic acid (SA), fumaric acid (FA), 1,3- propanediol (PDD), 1,4- broexiel/(SA), fumaric acid (FA), 1,3- propanediol (PDD), 1,4- broexiel/(SA)     Melt polycondensation process     Elongation at break>800% and 30MPa of tensile     Environmentally friendly and biodegradable TPUs     89						obtained trans-1,4	
Poly(farnesene -co-glycidyl methacrylate)NMP copolymerizationDepend on the initiator used in the synthesis can be obtained poly(farnesene- golymer blends.Functional groups into methacrylate can be used to compatibilized the polymer matrix with fillers or immiscible polymer blends.49Mathematical restrictmethacrylate)NMP copolymerizationDepend on the initiator used in the synthesis can be obtained poly(farnesene-b- GMA)Functional groups into methacrylate can be used to compatibilized the polymer blends.49Poly(styrene- co-farnesene)Coordinative copolymerizationLanthanidocene incorporation of incorporation of 3,4-polyterpene units.Essentially the microstructure consists of 1,4 and 3,4-polyterpene units.62Poly(styrene- co-farnesene)Two-Step polymerizationPoly(lactide-co- caprolactone)Display shape memory and biocompatibility.87Polyurethane sDiphenylmethane diisocyanate (MDI) and poly(lactide-co- caprolactone)Two-Step polymerizationDisplay shape memory and biocompatibility.87Succinic acid (SU), sebacic acid (SA), fumaric acid (FA), 1,3- propanediol (PDO), 1,4-Melt polycondensationElongation at biodegradable TPUs89Succinic acid (PDO), 1,4-Melt polycondensationElongation at biodegradable TPUs89						or cis-1,4	
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Poly(farnesene -co-glycidyl methacrylate)copolymerization the synthesis can be obtained poly(farnesene- stat-GMA) and poly(farnesene-b GMA)initiator used in can be used to polymer matrix with fillers or immiscible polymer blends.Poly(farnesene-b oplymer co-farnesene)Coordinative copolymerizationCoordinative polymerizationEssentially the microstructure consists of 1,4 and incorporation of the copolymer.62Poly(styrene- co-farnesene)Coordinative copolymerizationLanthanidocene polymer catalyst allow to microstructure of β-farnesene in the copolymer.62Polyurethane sDiphenylmethane diisocyanate (MDI) and poly(lactide-co- caprolactone)Two-Step polymerization processPoly(catide-co- caprolactone)Display shape memory and biocompatibility.87Succinic acid (SU), sebacic acid (SA), fumaric acid (FA), 1,3- propanediol (PDO), 1,4-Melt polycondensationElongation at break>800% and stability and mechanical biodegradable TPUs89				NMP	Depend on the	Functional groups	49
-co-glycidyl methacrylate)the synthesis can be obtained poly(farnesene-b golymer matrix with poly(farnesene-b- golymer blends.can be used to compatibilized the poly(farnesene-b- golymer blends.Poly(styrene- co-farnesene)Coordinative copolymerizationLanthanidocene catalyst allow to produce an incorporation of the copolymer.Essentially the microstructure consists of 1,4 and 3,4-polyterpene units.62Poly(styrene- co-farnesene)Coordinative copolymerizationLanthanidocene produce an incorporation of the copolymer.Essentially the microstructure consists of 1,4 and 3,4-polyterpene units.62Polyurethane sDiphenylmethane diisocyanate (MDI) and poly(lactide-co- caprolactone)Two-Step polymerization processPoly(lactide-co- caprolactone)Display shape memory and segment improve segment improve the thermal stability and applications if mechanical properties.87Succinic acid (SU), sebacic acid (SA), fumaric acid (FA), 1,3- propanediol (PDO), 1,4-Melt polycondensationElongation at bioegradable TPUsEnvironmentally friendly and biodegradable TPUs			Poly(farnesene	copolymerization	initiator used in	into methacrylate	
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Polyurethane sDiphenylmethane diisocyanate (MDI) and poly(lactide-co- caprolactone)Two-Step polymerizationPoly(lactide-co- caprolactone)Diphenylmethane diisocyanate polymerizationTwo-Step polymerizationPoly(lactide-co- caprolactone)Display shape methanical polymerization87 methanical polymerizationPolyurethane sSuccinic acid (SU), sebacic acid (SA), fumaric acid (FA), 1,3- propanediol (PDO), 1,4-1Melt polycondensationElongation at produce an incorporation of catalyst allow to produce an incorporation of segment improve segment improve88 promedical field. promedical field.89 segment improve biocompatibility. progenties.89 segment improve biodegradable TPUs89 segment improve biodegradable TPUs89 segmen			methacrylate)		be obtained	compatibilized the	
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Polyurethane sDiphenylmethane diisocyanate (MDI) and poly(lactide-co- caprolactone)Two-Step polymerizationPoly(lactide-co- caprolactone)Diphenylmethane diisocyanate (MDI) and poly(lactide-co- caprolactone)Two-Step polymerizationPoly(lactide-co- caprolactone)Display shape memory and biocompatibility.87Succinic acid (SU), sebacic acid (SA), fumaric acid (FA), 1,3- propanediol (PDO), 1,4-Melt polycondensationElongation at break>800% and 30MPa of tensileEnvironmentally friendly and biodegradable TPUs89					stat-GMA) and	fillers or immiscible	
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Poly sDiphenylmethane diisocyanate (MDI) and poly(lactide-co- caprolactone)Two-Step polymerization processPoly(lactide-co- caprolactone)Diphenylmethane diisocyanate polymerization processPoly(lactide-co- caprolactone)S*7Succinic acid (SU), sebacic acid (SA), fumaric acid (FA), 1,3- propanediol (PDO), 1,4-Two-Step polymerization processPoly(lactide-co- caprolactone)Diphenylmethane polymerization processDiphenylmethane caprolactone)**7Succinic acid (SU), sebacic acid (SA), fumaric acid (FA), 1,3- propanediol (PDO), 1,4-Melt polycondensationElongation at promethane some and some and some and some and some and some and propanediol (PDO), 1,4-*********************************				copolymerization	catalyst allow to	microstructure	
Poly(styrene- co-farnesene)Poly(styrene- co-farnesene)incorporation of 2.5 to 9.8 mol% of β-farnesene in the copolymer.3,4-polyterpene units.Polyurethane sDiphenylmethane diisocyanate (MDI) and poly(lactide-co- caprolactone)Two-Step polymerization processPoly(lactide-co- caprolactone)Display shape memory and biocompatibility.87Polycinction sCaprolactone)polymerization processSegment improve the thermal stability and properties.Display shape memory and biocompatibility.87Succinic acid (SU), sebacic acid (SA), fumaric acid (FA), 1,3- propanediol (PDO), 1,4-Melt polycondensationElongation at break>800% and 30MPa of tensileEnvironmentally biodegradable TPUs89					produce an	consists of 1,4 and	
Poly(styrene- co-farnesene)2.5 to 9.8 mol% of β-farnesene in the copolymer.units.Polyurethane sDiphenylmethane diisocyanate (MDI) and poly(lactide-co- caprolactone)Two-Step polymerization processPoly(lactide-co- caprolactone)Display shape memory and biocompatibility.87Polyurethane s(MDI) and poly(lactide-co- caprolactone)Two-Step polymerization processPoly(lactide-co- caprolactone)Display shape memory and biocompatibility.87Succinic acid (SU), sebacic acid (SA), fumaric acid (FA), 1,3- propanediol (PDO), 1,4-Melt polycondensationElongation at break>800% and 30MPa of tensileEnvironmentally biodegradable TPUs89					incorporation of	3,4-polyterpene	
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PolyurethaneDiphenylmethane diisocyanate (MDI) and poly(lactide-co- caprolactone)Two-Step polymerizationPoly(lactide-co- caprolactone)Display shape memory and87s(MDI) and poly(lactide-co- caprolactone)polymerization processcaprolactone)memory and biocompatibility.87caprolactone)processsegment improve stability and mechanicalbiocompatibility.1biocompatibility.processstability and mechanicalapplications if biomedical field.Succinic acid (SU), sebacic acid (SA), fumaric acid (FA), 1,3- propanediol (PDO), 1,4-MeltElongation at brogather the discompatibilitybiodegradable TPUsproperties.89			co-farnesene)		of $\beta$ -farnesene in		
Polyurethane s     Diphenylmethane diisocyanate (MDI) and poly(lactide-co- caprolactone)     Two-Step polymerization     Poly(lactide-co- caprolactone)     Display shape memory and     87       s     (MDI) and poly(lactide-co- caprolactone)     polymerization     segment improve segment improve     Display shape memory and     87       s     stability and mechanical properties.     Poly(lactide-co- caprolactone)     Display shape memory and     87       Succinic acid (SU), sebacic acid (SA), fumaric acid (FA), 1,3- propanediol (PDO), 1,4-     Melt polycondensation     Elongation at break>800% and 30MPa of tensile     Environmentally friendly and biodegradable TPUs     89					the copolymer.		
s (MDI) and poly(lactide-co- caprolactone) polymerization process segment improve the thermal promising applications if biomedical field. Succinic acid (SU), sebacic acid (SA), fumaric acid (FA), 1,3- propanediol (PDO), 1,4- biocompatibility. Melt polycondensation break>800% and friendly and biodegradable TPUs biodegradable TPUs	Polyurethane	Diphenylmetha	ane diisocyanate	Two-Step	Poly(lactide-co-	Display shape	87
caprolactone)processsegment improve the thermal stability and mechanical properties.biocompatibility. Promising applications if biomedical field.Succinic acid (SU), sebacic acid (SA), fumaric acid (FA), 1,3- propanediol (PDO), 1,4-MeltElongation at break>800% and 30MPa of tensileEnvironmentally biodegradable TPUs89	S	(MDI) and polv(lactide-co-		polymerization	caprolactone)	memory and	
Succinic acid (SU), sebacic acid (SA), fumaric acid (FA), 1,3- propanediol (PDO), 1,4- Melt Elongation at broak>800% and 30MPa of tensile Environmentally biodegradable TPUs <sup>89</sup>		caprol	lactone)	process	segment improve	biocompatibility.	
Succinic acid (SU), sebacic acid (SA), fumaric acid (FA), 1,3- propanediol (PDO), 1,4- Melt polycondensation 30MPa of tensile Environmentally biodegradable TPUs <sup>89</sup>					the thermal	Promising	
Succinic acid (SU), sebacic acid Melt Elongation at Environmentally   (SA), fumaric acid (FA), 1,3- polycondensation break>800% and friendly and   propanediol (PDO), 1,4- 30MPa of tensile biodegradable TPUs					stability and	applications if	
Succinic acid (SU), sebacic acid Melt Elongation at Environmentally   (SA), fumaric acid (FA), 1,3- polycondensation break>800% and friendly and   propanediol (PDO), 1,4- 30MPa of tensile biodegradable TPUs					, mechanical	biomedical field.	
Succinic acid (SU), sebacic acid Melt Elongation at Environmentally   (SA), fumaric acid (FA), 1,3- polycondensation break>800% and friendly and   propanediol (PDO), 1,4- 30MPa of tensile biodegradable TPUs					properties.		
(SA), fumaric acid (FA), 1,3- propanediol (PDO), 1,4- brock-sector break-sector break-sector friendly and Brock-sector break-sector bre		Succinic acid (	SU), sebacic acid	Melt	Elongation at	Environmentallv	89
propanediol (PDO), 1,4- biodegradable TPUs		(SA), fumario	acid (FA), 1,3-	polycondensation	break>800% and	friendly and	
		propanedic	ol (PDO), 1.4-	, ,	30MPa of tensile	biodegradable TPUs	
butanedioi (BDO) and MDI		butanediol (	BDO) and MDI		strength with a	0	

			macrodiol composition of 60%.		
	Poly(1,3-propylene succinate) glycol (PPS), MDI and BDO	One-pot solvent- free polymerization	The use of PPS with high molecular weight in the TPU exhibit better mechanical properties.	Fully biobased TPU with thermo- induced shape memory.	90
	Tall oil (TO)based polyol, soybean oil (SO)-based polyol, rapeseed oil (RO)-based polyol, poly(ethylene adipate (PEA), MDI, ethylenglycol (EG) and dicyandiamide (DYDI)	One-step method	Macrodiols based on tall and rapeseed oil lead to materials with better fire resistance properties.	PUs with TO polyols have lower emission of carbon monoxide than the reference material.	91
	Polytetramethylene ether glicol (PTMEG), MDI, BDO and isosorbide.	Pre-polymer method	The isosorbide content affects thermal and mechanical properties.	Use of isosorbide as biobased chain extender.	92, 93
	Polycarbonate diol (PCD), isosorbide and hexamethylene diisocyanate (HDI).	One-step condensation polymerization	T <sub>g</sub> of the TPU depend on the isosorbide/PCD ratio.	TPU display biocompatibility and flexibility.	94
	Isosorbide, MDI and rapeseed oil-issued polyester polyol	Two-step synthesis	The presence of isosorbide results in a slight increase of hardness and shape retention	Do not increase the water absorption by the presence of isosorbide significantly	95
	Azealic acid, isosorbide, MDI and BPO		The polyester polyol was synthesized by esterification of azelaic acid and isosorbide	Properties are dependent on the content of diisocyanate	96
	Poly(tetra-methylene ether glicol), MDI and Isosorbide or isomannide	Pre-polymer method	Display reversible properties that allow reprocessablity at mild temperatures	The presence of isosorbide or isomannide as chain extender improve the self-healing features.	97
	Poly(propylene succinate)s, MDI, BPO and 1,3-propanediol (PDO)	Pre-polymer method	Elongation at break up to 550% and tensile strength of 30 MPa	Biobased thermoplastic polyurethane elastomers with low stiffness and good damping capacity	98
	Biobased diisocyanate (bio- DIC), BPO, HDI and α, β- oligo(ethylene-butylene adipate) diol	Pre-polymer method	Tensile strength from 6.5 to 33.3 MPa with a content of 50% of bio-DIC	Content of the bio- DIC affects thermal and thermomechanical properties.	99
Polyesters	Poly(L-lactide- <i>b</i> -ε-decalactone- <i>b</i> -L-lactide)	ROP	M <sub>n</sub> > 30 kDa Đ ≤ 1.5	Copolymers with a T <sub>g</sub> of -50°C to compositions of mol% of 40/60 and 80/20 of LLA/EDL, respectively	107, 108

Poly(L-lactide- <i>b</i> -δ-decalactone-	ROTEP	Display	Develop of new	110
<i>b</i> -L-lactone)		elastomeric	sustainable	
		behavior with	copolymers.	
Polylastida sa polymonthida	POTED	Wax appearance.	Dovelop to replace	109
co-polylactide	RUIEP	hehavior Young's	the commercial	
		module of	styrenic block	
		26.8±2.1 MPa	polymers	
		and strain at		
		break of 765±40%		
Poly(ethylenglicol-b-	ROP	Amphiphilic block	Potential biomedical	111
$\epsilon$ -decalactone) and poly( $\epsilon$ -		copolymers with	applications due its	
decalactone- <i>b</i> -ethylenglicol- <i>b</i> -		self-assemble	low cytotoxicity and	
e-decalactone)		Flastomeric	biodegradability	
		properties not		
		mentioned.		
Poly(lactide)-b-	ROTEP	Good control	Attractive TPE due	112
poly(caprolactone- <i>co</i> -ε-		over composition	its tunable	
decalactone)- <i>b</i> -poly(lactide)		and narrow	mechanical	
		relation between	properties.	
		composition and		
		behavior.		
Polv(γ-methyl-ε-caprolactone)	ROP	Cross-linked with	Promising	113
		β-lactone (4,4-	removable and	
		(ethane-1,2-	biodegradable	
		diyl)bis(oxetan-2-	elastomers.	
	_	one)		
Poly(lactide)- <i>b</i> -poly( $\gamma$ -methyl- $\varepsilon$ -	ROTEP	The use of	ABA block polymers	114
caprolactone)- <i>b</i> -poly(lactide)		isotactic PLA that	as replace	
		there a increase	conventional TPES	
		in strength and		
		toughness		
		-		
Poly(β-myrcene)-graft-poly(L-	ROP	Copolymers with	Fully biobased TPE	118
lactide)		high molecular	with tunable	
		weights and	mechanical	
		distributions	to the PLLA /PMV	
		distributions.	content.	
Poly(limonene carbonate)-b-	ROP and LO/ CO <sub>2</sub>	Hard	Fully biobased ABA	115
poly(ε-caprolactone)-b-	ROCOP	compositions	triblock polymer and	
poly(limonene carbonate)		from 21-63 wt%	able to be	
		of poly(limonene	chemically recycled.	
		carbonate).		
		of 21.2 MPa and		
		elongation at		
		break around of		
		400%		
Poly(hexamethylene 2,5-	Transesterificatio	Present shape-	The predominance	116
furanodicarboxylate)-b-	n and melt	memory polymer	of	
poly(tetrahydrofuran)	polycondensation	behavior induced	poly(tetrahydrofura	
	•	by temperature.	n) segments	
			recovery properties	
Poly(1.4-butylene 2.5-	Transesterificatio	PBBS soft	Potential biomedical	117
furandicarboxylate)-PBSS	n and melt	segment could	applications due the	
,,	polycondensation	tunning the	copolymers are	
			nontoxic, thermally	

	mechanical	stable and	
	properties.	renewable	