

C O N C L U S I O N S

- 1.** Phosphorus- and silicon-containing spiroorthoesters were synthesized by two different approaches: esterification reaction or Michael addition from spiroorthoester precursors. The spiroorthoester moiety was obtained from γ -butirolactone and an epoxide.
- 2.** Linear polymers which contain phosphorus and spiroorthoester moieties in the side chain were obtained by radical polymerization from an acrylate-containing spiroorthoester and different radically polymerizable phosphorus-containing comonomers. The polymers were crosslinked by a cationic double ring-opening of the spiroorthoester moieties with ytterbium triflate as an initiator.
- 3.** Linear polymers which contain a spiroorthoester moiety in the side chain were successfully crosslinked with phosphorus-containing glycidyl derivatives.
- 4.** Microwave irradiation showed to be useful method to synthesize one of the phosphorus-containing spiroorthoesters, which could not be obtained by conventional heating. These conditions allowed the crosslinking of a SOE with DGEBA with lanthanide triflates as initiators in reaction times significantly shorter than in conventional heating conditions.
- 5.** All the above synthetic approaches led to materials with phosphorus or silicon heteroatoms and linear ester-ether moieties, introduced by double ring-opening of SOEs, which showed enhanced flame retardance and low shrinkage or even expansion upon curing.