^{31}P NMR WITH *IN SITU* IRRADIATION FOR STUDY OF SELF-IMMOLATION

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Self-immolation (SI) is a fragmentation of a molecule via intermolecular cyclization upon external stimuli. The activated intermediate spontaneously cyclizes while releasing a cargo which is used in a range of applications, such as smart materials or drug delivery systems. The phosphorus-based SI linkers stand above the "classical" carbamate linkers. They allow attachment of additional substituent, and, therefore, can be ideal candidates for a double cargo delivery.

We synthetized series of phosphate-based SI linkers able to release two cargos (Fig. 1). The SI was initiated by UV light, and the reaction course was monitored by ^{31}P NMR spectroscopy with *in situ* irradiation in real time. The structure of the intermediates was determined directly *in situ* combining ^{31}P and ^{13}C NMR spectra. Structural modifications allowed us to drive the sequential release of two cargos.[1] This structure-activity relationship study enabled us to fine-tune the velocity of SI from 1 day up to 5 minutes, thus, greatly widened possible applications of the phosphate-based SI linkers. Moreover, these results were used for a rational design of new SI systems for a delivery of amine-containing drugs.[2]

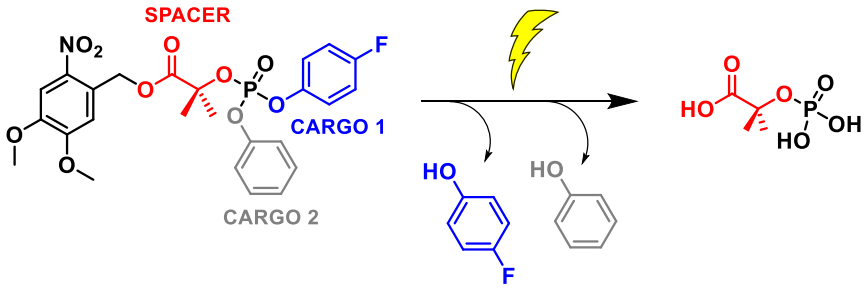

Figure 1. An example of a α-hydroxyisobutyrate SI spacer studied in this work.

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REFERENCES

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