Thermosetting polyurethane foams by supercritical CO_2 as physical blowing agent

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The aim of the present study was the achievement of thermosetting polyurethane foams by a batch foaming process that uses CO_2 as a physical blowing agent. In particular, to address the recent interest in combining the gas (physical) foaming with the classical (chemical) polyurethane foaming, a novel instrumented pressure vessel was designed for investigating: i) sorption under high gas pressure on the two, separate, components of the polyurethane foams, ii) synthesis under high gas pressure after the two components mixing, and iii) foaming upon release of the pressure. Results revealed a significant effect of sorbed CO_2 on the polyurethane synthesis and the need for the design of a new chemistry to exploit the use of physical foaming on thermosetting polyurethanes.