

Jessop, P.G., Cunningham, M.F.; **CO₂-Switchable Materials**, The Royal Society of Chemistry, 2020

CO₂-responsive materials are a relatively recent innovation. In general, stimuli-responsive materials exhibit reversible changes in their physical or chemical properties in response to external triggers such as temperature, pH, light, or voltage. However, there are often limitations in applying these triggers including economic and environmental costs, and product contamination. The realization that CO₂ can be used as an effective trigger for stimulating changes in material properties has prompted a surge in interest in this area within the past few years, with numerous new studies currently underway in several countries. CO₂ is an ideal trigger for switchable or stimuli-responsive materials because it is benign, inexpensive, green, abundant, and does not accumulate in the system. Many different CO₂-responsive materials including polymers, latexes, solvents, solutes, gels, surfactants, and catalysts have been prepared.

Summarizing recent progress in the preparation, self-assembly, and functional applications of CO₂-responsive materials, this book explores the physical chemistry of CO₂-switching, including constraints on structural design and process conditions, together with applications. With emphasis on the environmental, health, and safety advantages and disadvantages compared to conventional materials, it is ideal for researchers and industrialists working in green chemistry, chemical engineering, and polymer chemistry.