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Abstract	:	The necessity to address climate change and shift towards sustainable energy systems has driven research into novel materials for carbon dioxide (CO₂) capture and energy storage. Deep eutectic solvents (DESs) and biomass have emerged as promising carbon precursors owing to their renewable nature and tunable properties. This review paper provides a comprehensive analysis of the utilization of DESs and biomass as carbon precursors, with a specific emphasis on their role in addressing the critical challenges of CO₂ capture and energy storage. We discuss the synthesis methods, structural characteristics, and performance of carbon materials derived from DESs, biomass, and other types of raw materials to emphasize their potential for enhanced CO₂ adsorption and efficient energy storage. Furthermore, we investigate the synergistic effects of combining DESs and biomass as carbon precursors, highlighting opportunities for tailored material design. Through a comparative analysis, we found that DES-derived porous carbon exhibits an excellent CO₂ uptake capacity ranging from 6.70 to 8.30 mmol/g, indicating the highest uptake capacity compared to other raw materials employed for the production of porous carbon in the study under review. Furthermore, DES-derived porous carbon for supercapacitor applications also reveals an outstanding specific capacitance ranging from 220 to 295 Fg⁻¹...see more.