

CO₂ upcycling by mineralization of a carbonate-based cementation materials

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Carbon Upcycling UCLA's CO₂NCRETETM manufacturing process captures flue gas-borne CO₂ and utilizes it to fabricate a low-CO₂ replacement for traditional Portland cement concrete. The central technology involves a novel carbonation process (patent pending) that rapidly captures CO₂ from dilute flue gas streams and stabilizes it via mineralization into limestone: a well-known natural cementation agent. The capability for direct flue gas utilization enables low-cost, high-throughput CO₂ conversion via mineralization. The final products of the CO₂NCRETETM process are modular elements that can be rapidly assembled to construct buildings and infrastructure. The process is designed to be scalable and easily integrated into industrial cycles which provide a ready source of CO₂, e.g., natural-gas or coal-fired power plants. CO₂NCRETETM's production is environmentally friendly, as it produces no harmful byproducts, and minimizes waste production and water usage.