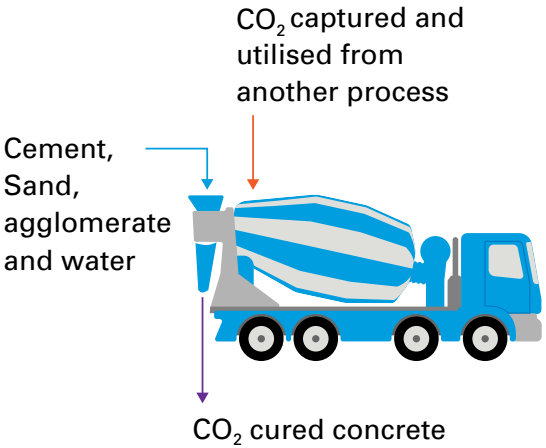
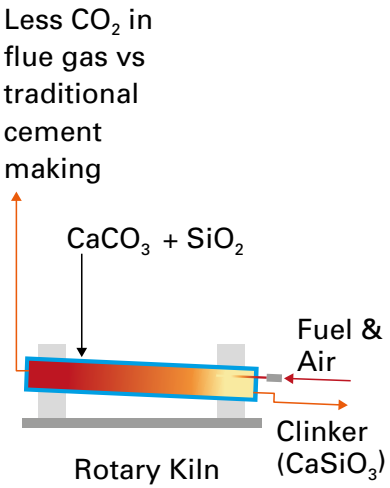
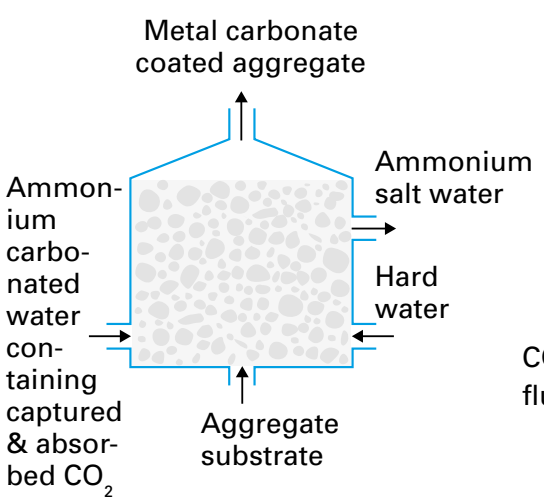
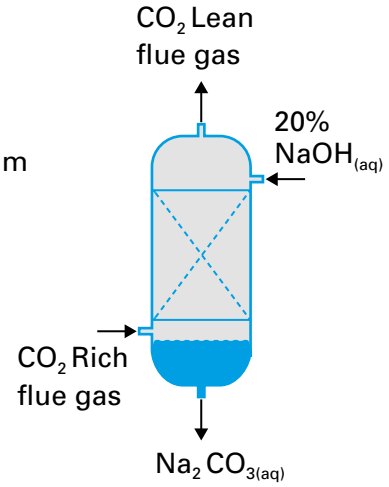
Mineralisation processes for CO_2 emissions reduction in cement making and concrete production

sbh4 consulting









	CO_2 cured concrete	New cement type based on calcium silicate instead of tricalcium silicate	Agglomerate recycling	Sodium bicarbonate formation
Mitigation principle	Cement use reduction through increased concrete strength and CO_2 utilisation	Reduced CO_2 flue gas emissions from cement clinker kiln and CO_2 utilisation	CO_2 mineralisation reaction with recycled or waste cements	CO_2 mineralisation from cement kiln and / or calciner flue gas
CO_2 Mitigation potential	CO_2 utilisation during concrete curing ~5% reduction from cement use reduction	CO_2 utilisation during concrete curing ~50% reduction from different cement chemistry	~90% reduction from CO_2 capture & mineralisation	~90% reduction from CO_2 capture
Carbonate formed	$CaCO_3$	$CaCO_3$	$CaCO_3$ and $MgCO_3$	Na_2CO_3
Raw material	$Ca(OH)_2$ from fresh concrete	$Ca(OH)_2$ from fresh concrete	$Ca(OH)_2$ in re-used concrete, CaO and MgO from fly ash and steel slag	NaOH produced from electrolysis of NaCl
Technology maturity level	Commercial, eg CarbonCure	Commercial, eg Solidia	Demonstration, eg Blue Planet	Demonstration, eg SkyMine