

Title (en)  
SEPARATION OF CARBON DIOXIDE (CO<sub>2</sub>) FROM GAS MIXTURES BY CALCIUM BASED REACTION SEPARATION ( CaRS-CO<sub>2</sub>) PROCESS

Title (de)  
ABTRENNUNG VON KOHLENDIOXID (CO<sub>2</sub>) AUS GASGEMISCHEN DURCH CALCIUMBASIERTES REAKTIONSABTRENNUNGSVERFAHREN (CARS-CO<sub>2</sub>)

Title (fr)  
SEPARATION DE DIOXYDE DE CARBONE (CO<sub>2</sub>) DE MELANGE DE GAZ PAR PROCESSUS DE SEPARATION PAR REACTION A BASE DE CALCIUM ( CARS-CO<sub>2</sub>)

Publication  
**EP 1899049 A2 20080319 (EN)**

Application  
**EP 06774232 A 20060628**

Priority  

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Abstract (en)  
[origin: WO2007002792A2] A reaction-based process has been developed for the selective removal of carbon dioxide (CO<sub>2</sub>) from a multicomponent gas mixture to provide a gaseous stream depleted in CO<sub>2</sub> compared to the inlet CO<sub>2</sub> concentration in the stream. The proposed process effects the separation of CO<sub>2</sub> from a mixture of gases (such as flue gas/fuel gas) by its reaction with metal oxides (such as calcium oxide). The Calcium based Reaction Separation for CO<sub>2</sub> (CaRS-CO<sub>2</sub>) process consists of contacting a CO<sub>2</sub> laden gas with calcium oxide (CaO) in a reactor such that CaO captures the CO<sub>2</sub> by the formation of calcium carbonate (CaCO<sub>3</sub>). Once "spent", CaCO<sub>3</sub> is regenerated by its calcination leading to the formation of fresh CaO sorbent and the evolution of a concentrated stream of CO<sub>2</sub>. The "regenerated" CaO is then recycled for the further capture of more CO<sub>2</sub>. This carbonation-calcination cycle forms the basis of the CaRS-CO<sub>2</sub> process. This process also identifies the application of a mesoporous CaCO<sub>3</sub> structure, developed by a process detailed elsewhere, that attains >90% conversion over multiple carbonation and calcination cycles. Lastly, thermal regeneration (calcination) under vacuum provided a better sorbent structure that maintained reproducible reactivity levels over multiple cycles.

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Cited by  
US7678351B2; US11858819B2; US7837975B2; US2022288556A1; US11554357B2; US11717802B2; US11918970B2

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