Supporting information

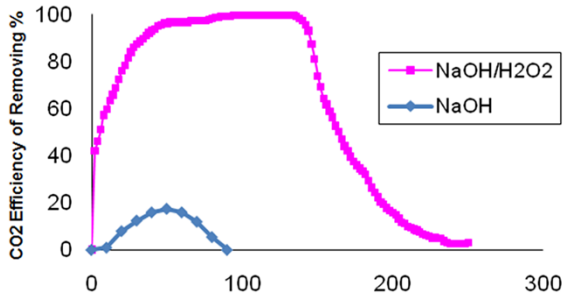

Figure S1: Hydroxide vs. superoxide as CO2 absorber under identical conditions. Reaction conditions: 0.25 mol sodium hydroxide, 0.375 mol hydrogen peroxide vs. 0.25 mol sodium hydroxide at room temperature and with CO2 flow rate of 1 lit/min, the scrubber contains 30 ml distilled water.

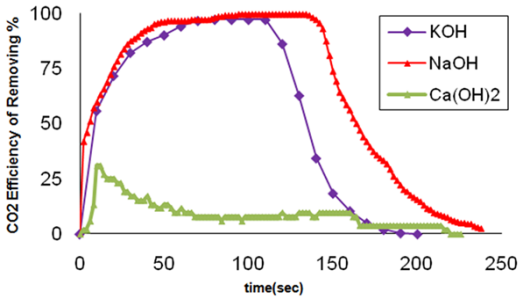

Figure S2: Abatement of CO_2 by different bases combined with hydrogen peroxide. Reaction conditions: 0.25 mol alkaline in 30 ml distilled water, 0.375 mol of hydrogen peroxide at room temperature and standard pressure, CO_2 flow rate of 1 lit/min.

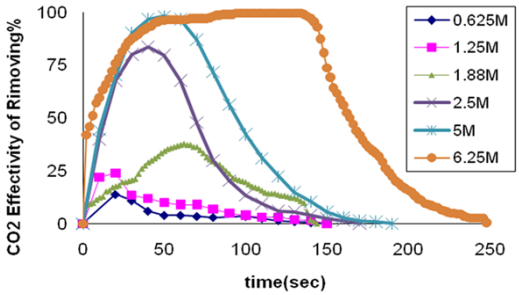

Figure S3: CO_2 absorption as function of sodium hydroxide concentration. Reaction conditions: 0.625-6.25 M of sodium hydroxide, 0.375 mol of hydrogen peroxide at 30 ml of distilled water and CO_2 flow rate of 1 lit/min, at room temperature and standard pressure.

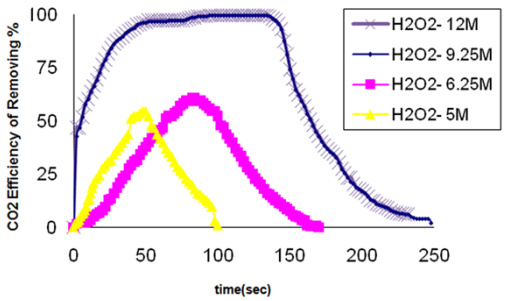

Figure S4: Carbon dioxide absorption as function of initial H_2O_2 concentration. Reaction conditions: 0.25 mol of alkaline in 30

ml distilled water and CO_2 flow rate of 1 lit/min, at room temperature and standard pressure.

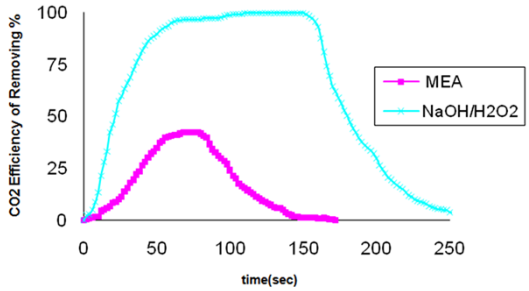

Figure S5: Superoxide vs. MEA absorption of CO_2. Reaction conditions: 0.25 mol sodium hydroxide in 30 ml distilled water, 0.375 mol of 30% hydrogen peroxide, total volume of 42 ml and CO_2 flow rate 1 lit/min. MEA: 0.5 mol in water, total volume of 42 ml, CO_2 flow rate 1 lit/min.

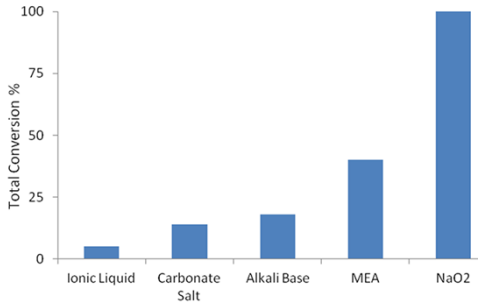

Figure S6: Total conversion in different CO_2 absorption scrubbers. Reaction conditions: 0.25 mol of sodium hydroxide or sodium carbonate, 0.5 mol of MEA or ionic liquid (BMIMF) and 0.25 mol of superoxide at CO_2 flow rate of 1 lit/min.

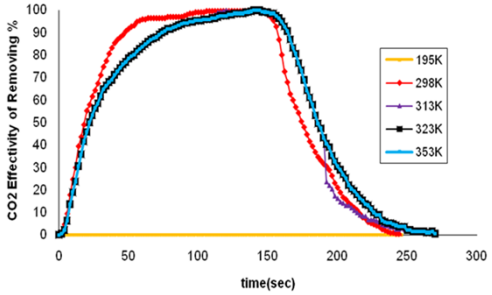

Figure S7: CO_2 absorption reactions as function of initial reaction temperature. Reaction conditions: 0.25 mol alkaline in 30 ml distilled water, 0.375 mol of hydrogen peroxide with temperature gradient and CO_2 flow rate of 1 lit/min.

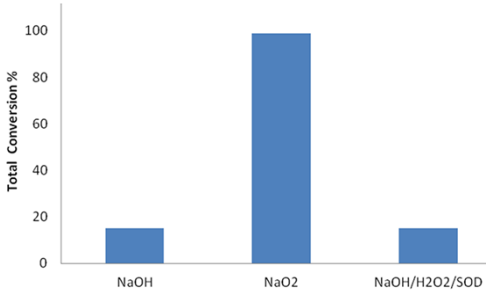

Figure S8: Effectiveness of CO_2 absorption as function of SOD enzyme addition. Two minutes test. Reaction conditions: 0.25 mol alkaline in 30 ml distilled water, 0.375 mol of hydrogen peroxide, 6U of SOD and CO_2 flow rate of 1 lit/min.

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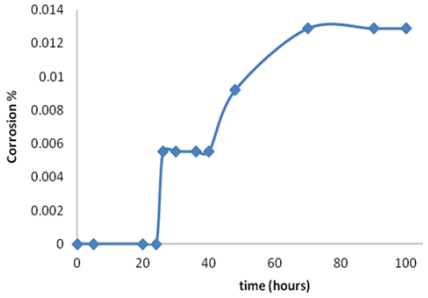

Figure S9: The gravimetric measurement of pipe corrosion in presence of superoxide reagent. Reaction conditions: 1mol sodium hydroxide, 2 mol hydrogen peroxide, 500 ml of water, type of metal test CS 1010, reaction time 100 hours. The corrosion was measured by gravimetric measurements.

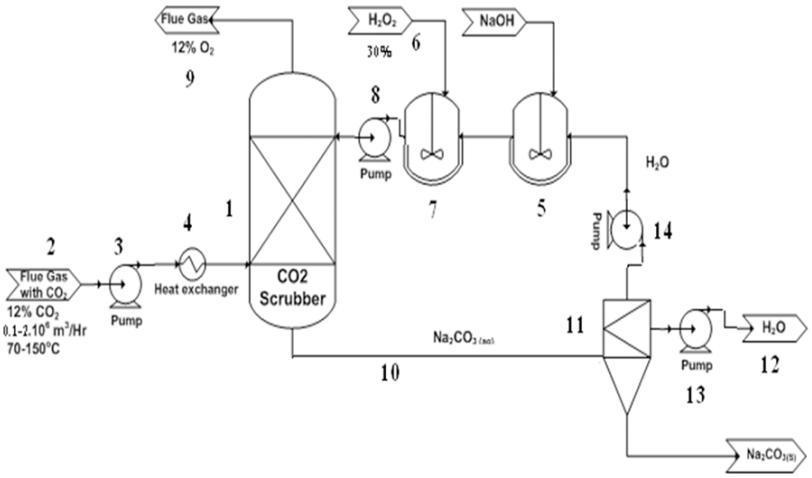

Figure S10: Illustrates a scrubbing apparatus suitable for carrying out the process of the invention.

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