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Utilisation of Industrial Carbon Dioxide Gas as the Main Raw Material

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Abstract: ***Burning fossil fuels like coal and oil is the primary cause of CO2 emissions. Carbon dioxide enters the atmosphere as a result of this. Neither CO2 has any colour or smell. It is created by plants through the natural process of photosynthesis and is necessary for life on Earth. CO2 enters the atmosphere as a result of the combustion of fossil fuels. Due to the low solubility of CO2 in water, it is difficult to detect CO2 at sea since it does not dissolve readily in saltwater. Removing CO2 from the atmosphere has several positive effects for civilization as a whole, but it also has numerous negative effects. These issues will be looked at in this article, along with a potential solutions for removing carbon dioxide from the atmosphere. Direct air capture is undoubtedly the strategy that has the best chance of eliminating carbon dioxide from the atmosphere. This entails directly removing CO2 from the air via a chemical process and storing it as a liquid or solid. Direct air capture is undoubtedly the strategy that has the best chance of eliminating carbon dioxide from the atmosphere.***

Keywords: suction pump, reaction chamber, co2 gas

I. INTRODUCTION

Burning fossil fuels like coal and oil is the biggest contributor to CO2 emissions. Carbon dioxide is emitted into the atmosphere when this occurs. A gas without colour or smell, carbon dioxide. It is naturally created by plants during photosynthesis and is crucial for life on Earth. CO2 is released into the atmosphere through the combustion of fossil fuels. Since CO2 is not highly soluble in water and does not readily dissolve in saltwater, it is challenging to detect at sea. Removing CO2 from the environment has a lot of advantages for society as a whole, but it also comes with a lot of drawbacks. These issues will be examined in this article, along with a number of potential solutions. Removing CO2 from the environment has several advantages for civilization as a whole, but there are numerous drawbacks as well. In this article, I'll look at these issues and a number of potential solutions for removing carbon dioxide from the atmosphere.

II. BACKGROUND

Carbon dioxide (CO2) is a greenhouse gas that is naturally present in the atmosphere and is produced by human activities such as burning fossil fuels, manufacturing, and land-use change. In the past century, human activities have increased the atmospheric concentrations of CO2 and other greenhouse gases, leading to climate change. The emissions of CO2 from industry is a major contributor to global warming. Industry contributes to global warming in two main ways: direct emissions of CO2 into the atmosphere, and indirect emissions caused by the burning of fossil fuels to generate energy. Direct emissions from industrial sources include the burning of coal, oil, and natural gas to produce energy, as well as the release of CO2 from manufacturing processes such as cement production, steel production, and aluminum production. Indirect emissions from the burning of fossil fuels to generate energy for industrial processes are referred to as “fuel-based” emissions. CO2 emissions from industry have increased significantly over the past few decades. In the United States, CO2 emissions from industry have increased by more than 50% since 1990, due to increased energy consumption. Globally, industry is responsible for about 24% of total CO2 emissions. This includes emissions from manufacturing, energy production, and other industrial processes. The International Energy Agency estimates that the global energy-related CO2 emissions from industry will reach a peak in 2030 and then start to decline. To achieve this, countries need to reduce their reliance on fossil fuels and shift to renewable energy sources. Governments can also introduce policies to reduce industrial emissions, such as setting emissions targets and introducing carbon pricing.

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Industrial CO2 emissions are a major contributor to global warming and climate change, and reducing them is essential for achieving a sustainable future. Countries must work together to reduce emissions from industry, and government policies can help to drive the transition to a low-carbon economy.

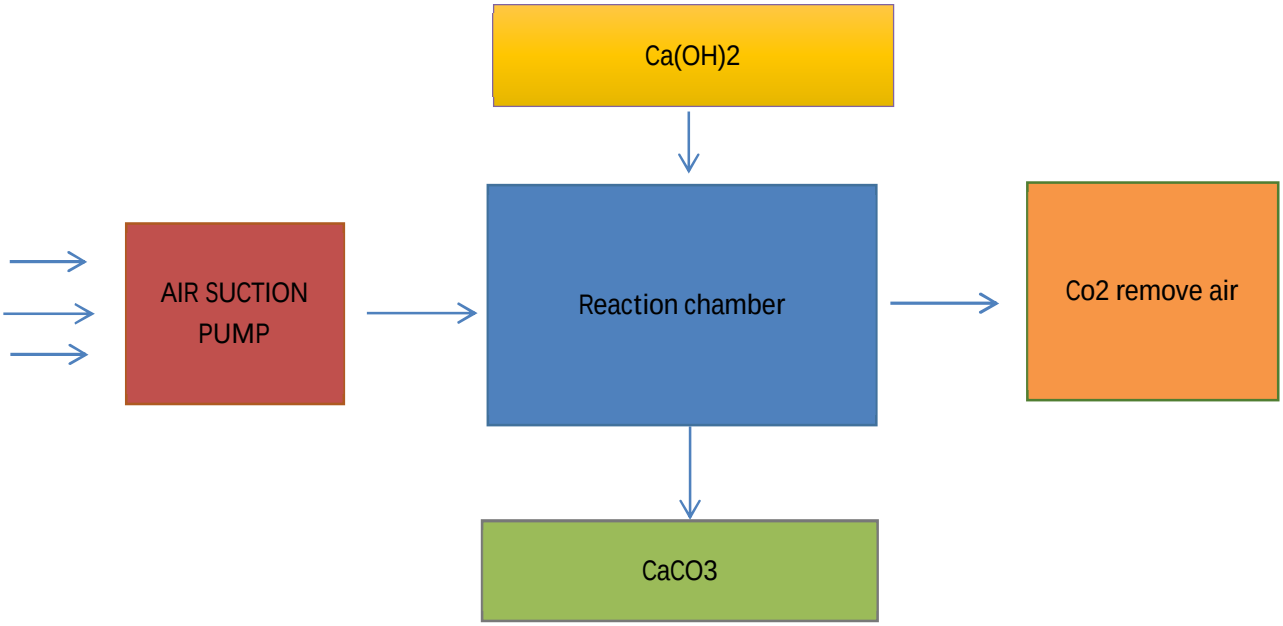
III. WORKING

This project is for removal of co 2 from atmosphare and make usefull byproduct for industries. We have to use calcium hydroxide for reaction and make calcium carbonate as an byproduct .The process of system is firstly air suction pump take air to reaction chamber .In reaction chamber Ca(OH)2 droplets mix with co2 gas and forms water and calcium hydroxide this process take 1-2 hours after that we take calcium carbonate saperate with water and use as industry as raw material.

Calcium carbonate (CaCO3) is a compound that is frequently used for a variety of things, such as as a filler and pigment material in paper, plastics, rubber, paints, and inks as well as pharmaceutics, cosmetics, and building materials.

After that we filter out the water from washing soda .Then we will distillate the calcium carbonate by distillation ,we have to keep heat on this process so that the product gas get high temperature and purify it by condensation steam which make our product purer than before.

IV. BLOCK DIAGRAM



V. REACTION

The chemical equation for this reaction is:

$Ca(OH)2 + CO2(g) \rightarrow H2O(l) + CaCO3$

Calcium hydroxide reacts with carbon dioxide to form calcium carbonate and water

VI. ADVANTAGE

1) Reduce green house effect and climate change.
2) Us byproduct for soap company as raw material from which cost of production goes low.
3) Reduce the effect of human health from climate change.

VII. CONCLUSION

This technology allows us to collect CO2 from the air in the form of calcium hydroxide, which is then used as a raw material in several industries. and maintain a clean environment while defending it against climate change.

Carbon dioxide (CO2), a significant greenhouse gas, will be used in this research to create calcium hydroxide. An essential chemical, calcium hydroxide is used in the manufacture of fertiliser, soap, paper, rubber, plastics, and other products. In a variety of industrial applications, it can be used to neutralise acids and bases.

In order to reduce CO2 emissions we will use calcium hydroxide as a source for CO2 removal and supercritical water (SCW) as a waste product.s

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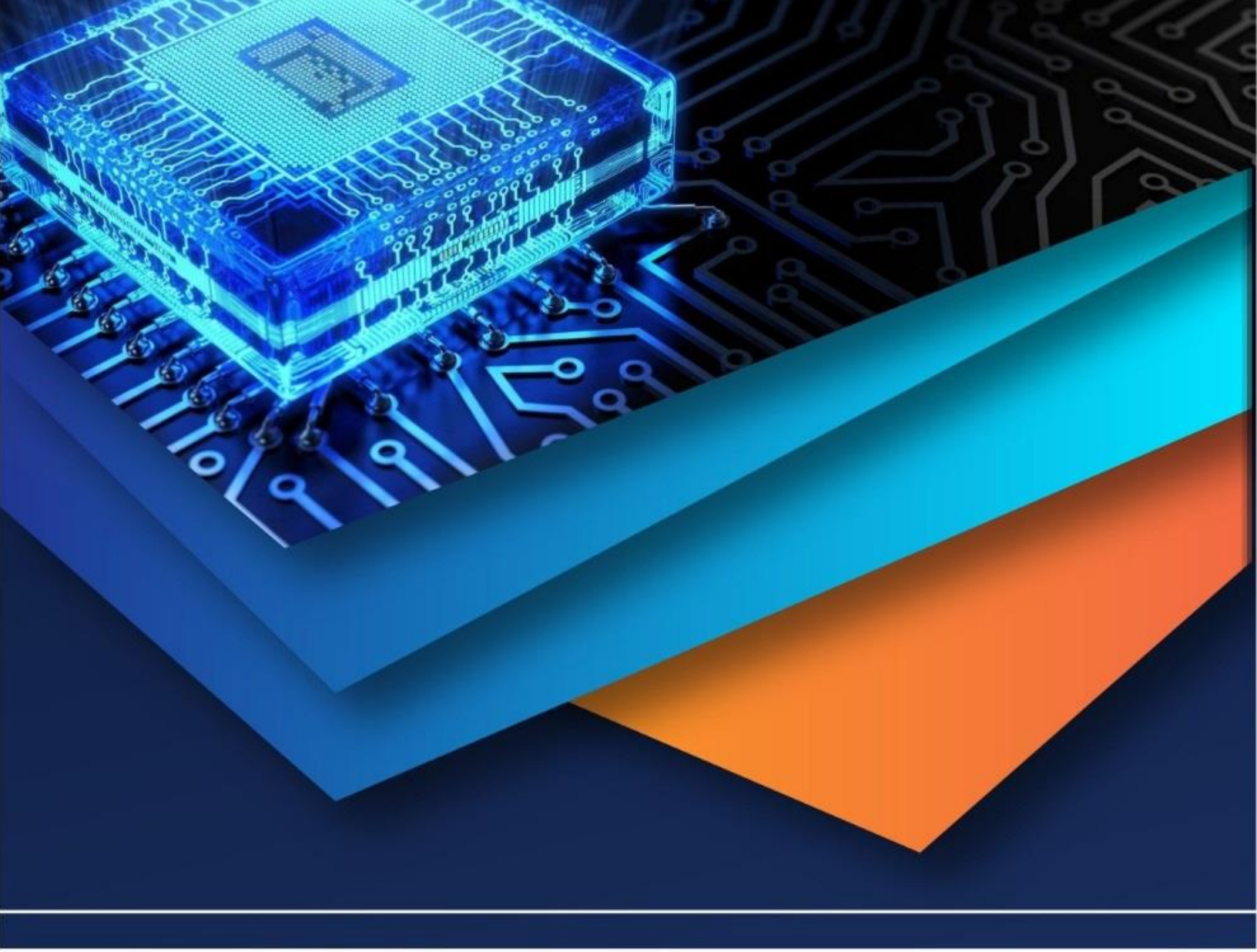

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