Chemistry Research Assignment

**Scrubbing Smoke Stack Emissions**

Find two articles about your topic

**Article 1:**

Arcaro, S. (2009, August 30). Scrubbing CO2 and sulfur from power plant emissions. Retrieved

April 07, 2017, from http://newatlas.com/scrubbing-co2-sulfur-from-emissions/12645/

**Article 2:**

LaMonica, M. (2015, February 02). MIT researchers developing better way to scrub smokestack

pollution - The Boston Globe. Retrieved April 07, 2017, from https://www.bostonglobe.com/business/2015/02/02/mit-researchers-developing-better-way-scrub-smokestack-pollution/FDvpDH4TszfMy7Rsicp1FK/story.html#comments

**Word Equation(s) :**

**a)**The process of scrubbing smoke stack emissions or flue gas desulfurization can be described using the word Equation: calcium carbonate + sulfur dioxide + water -> calcium + carbon dioxide + bisulfite. The information that can lead to this equation can be found on the Dartmouth Website.The word equation can be written as the chemical equation CaCO3 + SO2 + H2O -> Ca + CO2 + HSO3. The chemical equation can be balanced as this: CaCO3 + 2 SO2 + H2O -> Ca + CO2 + 2 HSO3.

**b)** The process of scrubbing smokestack emissions or Wet-Limestone Scrubbing Fundamentals can be described as by the word equation : calcium carbonate + hydrogen + sulfite -> calcium + sulfite + water + carbon dioxide. The skeletal equation for this is as follows: CaCO3 + H + SO3→ Ca + SO3 + H2O + CO2

and the balanced equation for it is : CaCO3 + 2H + SO3→ Ca + SO3 + H2O + CO2

The information can be found on the following website:-

<http://www.power-eng.com/articles/print/volume-110/issue-8/features/wet-limestone-scrubbing-fundamentals.html>

Scrubbing smokestack emissions (What is it?)

There are many issues by what we as humans daily do. One of the major problem is smokestack emission. What are smokestack emissions? Smokestack emissions are the pollutants that come out of any manufacturing building which releases the waste. Scrubbers are the air pollution control devices that are found in the tall smokestacks of factories. They filter particles and dust from the emissions produced. Smokestack emissions cause a great deal of climate change which affects humans, animals and plants by the rise in sea levels, food production, damage of wildlife habitats and harsh weather events. Smokestack emissions can cause acid rain which damages plants. Less plants means less food production and habitat for animals. Acid rain can pollute lakes or other water bodies. The animals that drink water from there will be affected and the effects are passed down from the food chain to other animals which will affect all of them. Factories have been developing innovative ideas to reduce pollution. One of the most common ways of reducing smokestack emissions is by using **renewable energy resources such as obtaining energy from the sun, wind and water** to power factories or buildings. Another way in reducing smokestack emissions is by **maintaining the smokestacks of all factories.** By maintaining smokestacks, **the scrubbers will easily** **filter out particles and not spread diseases** which reduces the number of people who get sick and **reduce pollution.** Following these recommendations are some of the cheapest and the easiest in keeping our environment and animals within healthy.

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| Legend  Underlined words:- environmental issues and challenges  **Bolded words:-** recommendations to improve the environment |

**References:-**

Arcaro, S. (2009, August 30). Scrubbing CO2 and sulfur from power plant emissions. Retrieved

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Nazaroff, Alvarez-Cohen, Mihelcic, & Zimmerman. (n.d.). Flue-Gas Desulfurization (“Scrubbers”).

Retrieved April 16, 2017, from

<https://engineering.dartmouth.edu/~d30345d/courses/engs37/Scrubber.pdf>

Wet-Limestone Scrubbing Fundamentals. (2006, January 8). Retrieved April 17, 2017, from http://www.power-eng.com/articles/print/volume-110/issue-8/features/wet-limestone-scrubbing-fundamentals.html