Free gas separation research paper sample

Business, Company

\n[toc title="Table of Contents"]\n

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Introduction

Several processes that have been developed to facilitate gas separation. The technique of gas separation could result in one single gas product or could give rise to a pure form of gas. The result would ultimately depend on the type of technique that was used for separation. The Swagelok Company makes this possible because it was involved in the sale of various gas and fluid equipment that facilitates the process of gas separation. The above does not mean that the process is devoid of challenges. Often, the system needs to be adequately assessed for the detection of anything that might be hazardous to individuals. Also, the equipment is prone to difficulty in fitting, working and the installation technique used. However, everything is prone to errors, and the situation can be avoided by the proper troubleshooting and detection of problems.

Current research goals

The current goals that we have are in relation to the troubleshooting of problems in the gas separation system. The problems usually emanate from the type of operation in the system, the columns, equipment, and gas flow. The troubleshooting of the problems can be achieved through the proper keeping of records in terms of gas flow, temperature, and density. The process could also take the form of a problem separation, where the parts that were seen as defective are separated to prevent leakages. The process fist begins with the identification of the most probable symptoms that a system may have. For instance, issues of long periods of a retention and broad peaks can be established as symptoms (Song, Fujiao, Yunxia Zhao, and Qin, 78-84). Once all the symptoms have been laid on the table, the cause for them becomes easy to anticipate and explore. The most potential sources of the leakage in gasses could emanate from the columns. When troubleshooting for problems, the column could be a good place to start. Ideally, the column problem would be solved by a replacement of the original column that is suspected to have a problem. If the subsequent works better than the original one, then the elimination method of troubleshooting would infer that the column cannot be the source of gas leakage. The other type of error, which results from the operation of the system, could be a potential cause of gaseous leakages. The operational errors can be eliminated by checking the carrier for gas flow and measuring the constant temperature in the gas system.

Additionally, the system could require a sample test or measurement that would ensure that the problem does not originate from the sample of the

instruments or equipment that was used. The purpose of troubleshooting, typically, is to eliminate the possibility of problems that could result in the leakage of gas from the process of gas separation. In addition, the use of electronic troubleshooting for leakage problems is also on the agenda. The thing about electronic detection is that it is accurate and would print to a leakage problem as opposed to when liquid detection was used.

A bubble meter allows for the measurement of gas at any temperature without there being a case of recalibration. The bubble meter is ideal for actual volume measurement in the flow of gasses because the temperature of the gas does not affect it in any way. In addition, the rates of gas flow could vary and would still be measureable. Gasses pose a problem when it comes to their measurement because of the issue of density and temperature. The variable in such cases is the pressure that the gasses need to possess their size to be ideal. The pressure in turn is involved in the change of volume of the gasses when they encounter some degrees of heat. Therefore, the bubble meter becomes the ideal instrument for measurement of actual volume of gas, which was essential for a proper analysis of the gas flow in relation to the system. The calibration of the mass spectrometer was facilitated through the use of the bubble meter, which in turn helps to facilitate an analysis that was accurate.

Progress

We have encountered problems in the tightening of joints in the system. The joints often need to be tightened well to prevent the escape of liquid air from the systems. Lack of proper is what fixing of the joints in equipment could also lead to the elimination of gas. There are different ways that pipes and

tubes can be joined, all of which differ depending on the type of materials that is used. When the process of tightening joints was reached, there were various problems that were experienced. First, the wrong methods of jointing were used because of the misleading information about the sealing done in the tubes from Swagelok. For instance, copper pipes are supposed to be joined using soldering, brazing or the incorporation of compression fitting. The materials that were acquired from the company indicated that the tubes were sealed by the use of copper when in fact they were not (Downie, 211-215). They had parts that were used in plastic, which mainly requires the use of heat welding for the joining process.

Consequently, the tubes remained untighten because of the wrong use of methods. They were sealed through the use of different materials from what they were believed to have. Other tubes were supposedly carbon steel when they were intended to be made from stainless steel and a hint of copper. In addition, there were pipes that had a mixture of sealing in terms of materials that made it difficult to apply the right methods that would ensure that the joints remained tight. The company also had pipes that had bare parts and were weakened by the extreme methods that were used in the joining process.

Results

After the careful analysis of the materials and the possible problems that might emanate from them, we are confident of our continued plans regarding the system. One of the methods involved includes the modification of the titanium system. We also intend to test the sorbent for to find out issue that relate to the maximum absorption of carbon dioxide when it is

exposed to different kinds of pressures. Our future goals were aimed at making the system better albeit the difficulties that the aspect of gas separation possesses. By testing the absorption of the gas at different pressures, we will be able to know how the technique would incorporated into the system and what will be replaced (Aldrich, 67-69). The research goals are also meant to better the system that will be useful in its overall performance. Additionally, the goals will determine the right amount of pressure that will be needed to surpass the issue of gas leakages.

Future goals

Titanium dioxide, also denoted as titanium (IV) oxide, is an oxide of titanium. Chemically, it is symbolized by a TiO_2 formula. Titanium dioxide could be used for the enrichment of different tools that need to be utilized for the measurement of gasses. Moreover, the fact that it is the most extensively used white tincture owing to its glare together with its high contemplative index makes it more efficient than other materials. Worth noting also is the fact that its applicability flows to the fashion industry as well. For instance, it used as a sunscreen as well as tattoo colorant.

However, the titanium dioxide ought to have passed through several steps in its modification of its useful levels. Modifying it with amines that included diethylenetriamine (DETA) and trithylenetetramine (TETA) denotes one of the approaches. They were characterized by the X-rays diffraction as well as transmission of electron microscopy to enable CO_2 capture and immersion. The fixed-bed reactor apparatus comprised with online mass spectroscopy were the primary equipment that would be necessary for the capture of the CO_2 as well as evaluate their capabilities. Imperatively, surface area, pure

volume, and pore size of the support determine the CO2 uptake capacity of the composite sorbents. With three kinds of amines, ethylenediamine, polyetherimide, and tetraethylenepentamine, there would more likelihood of absorbing higher levels of amino group content resulting from a relatively stable titanium dioxide (" Capturing CO2 with Amine-Impregnated Titanium Oxides, 2-4).

Thanks for the information perused in the process of getting more insights to the exceeding subject, I was able to comprehend that titanium dioxide denotes several colorants. That explains why it was widely used as whiteners by illustration paints, plastics, and papers. Moreover, I was able to deduce that titanium dioxide is never compatible with reliable agents and acids since they would result to violent antiphons.

Work Cited

" Capturing CO2 with Amine-Impregnated Titanium Oxides." Energy Fuels (2013). Print.

" Swagelok® Company." Analytical Chemistry (2013): 758A. Print.

Aldrich, Sigma. " Packed Column GC Troubleshooting Guide: How to Locate Problems and Solve Them." Bulletin (2014). Print.

Downie, N. A. Industrial Gases. New York: Kluwer Academic Pub., 2002. Print.

Song, Fujiao, Yunxia Zhao, and Qin Zhong. " Adsorption of Carbon Dioxide on Amine-modified TiO2 Nanotubes." (2012). Print.