Device for Detecting Contaminants in CO2 Dispensers Before and During CO2 Angiography

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Technology description

Enables Safe CO2 Angiography by Identifying Trace Impurities in CO2 Reservoirs

This sensor detects the presence of contaminants in carbon dioxide (CO2) dispensers before and during angiogram procedures. Commonly used angiography techniques require the injection of a liquid contrast medium, which holds high risks for patients with allergies to one or more of its components and for those with compromised liver or kidney function. Even among persons with no known risk factors, side effects can range from vomiting and mild hives to renal failure and even death. Approximately 200 out of every 100,000 patients will develop severe reactions following contrast media injection. The proper use of CO2 for angiographic purposes does not cause these allergic reactions or damage to vital organs. However, available CO2 angiography technologies cannot identify contamination, preventing the widespread acceptance and use of CO2 angiography within the medical community. Researchers at the University of Florida have developed a sensor that alerts the user of air contamination while utilizing CO2 angiography. This detector enhances the safety of CO2 angiography as a diagnostic procedure and significantly improves patient comfort. The sensor also cuts costs due to the implementation of a less expensive angiography technique.

Technology

Carbon dioxide has unique properties that make it particularly useful as a contrast agent in diagnostic imaging procedures. For example, CO2 does not cause an allergic response and safely accommodates patients with poor renal function. Despite this, CO2 angiography’ s inability to detect dangerous nitrogen and air contamination in carbon dioxide reservoirs has limited its widespread adoption. This sensor entails an optical spectrometer with sensitivity to infiltration of these colorless and odorless gasses. When the device detects contaminants, it immediately shuts down CO2 delivery, protecting patients from embolisms (blood vessel occlusion caused by trapped air/nitrogen). The incorporation of this device into CO2 delivery systems will eliminate the potential for human error, potentially promoting CO2 angiography as the standard protocol for diagnostic imaging.

Application area

Detector that identifies the presence of air or nitrogen contaminants in carbon dioxide reservoirs, permitting the widespread use of CO2 angiography

Advantages

Eliminates the need to inject liquid contrast mediums for medical imaging techniques, dramatically improving patient safety
Uses CO2, avoiding allergic reactions and damage to the liver and kidneys
Detects contaminants, overcoming an obstacle to CO2 angiography’ s widespread adoption
Senses even trace amounts of air or nitrogen in CO2 reservoirs, preventing human error that can lead to blood vessel occlusion
Permits various total volumes (provided doses are administered at least two minutes apart), lengthening healthcare providers’ viewing times for more accurate diagnoses

Institution

University of Florida

Inventors

Ray Thomas
Assistant In
GEOLOGY

叶先生

电 话：021-65679356

手 机：13414935137

邮 箱：yeyingsheng@zf-ym.com