

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

The University of Florida is seeking companies interested in commercializing a sensor that will detect the presence of contaminants in carbon dioxide (CO₂) dispensers before and during angiogram procedures. Used to visualize organs and blood vessels, CO₂ angiography has several advantages over traditional medical-imaging techniques. Approaches that require the injection of a liquid contrast medium are particularly risky for patients who are allergic 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 157 out of every 100,000 patients will develop severe reactions following contrast media injection. Comparatively, the proper use of CO₂ for angiographic purposes does not cause allergic reactions or damage to vital organs. It is also less expensive and more comfortable for patients. Unfortunately, an inability to ensure contaminant identification has prevented CO₂ angiography's widespread acceptance by the medical community. A University of Florida researcher has developed a sensor that will vastly improve the safety of this important diagnostic procedure.

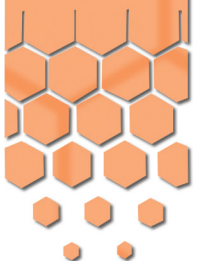


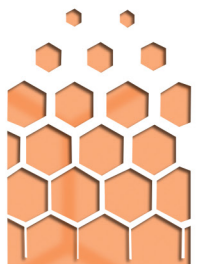
Applications

A 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
- ◆ Sensitive to even trace amounts of air or nitrogen in CO₂ reservoirs, preventing human error that can lead to blood vessel occlusion
- ◆ Does not limit total volumes (provided doses are administered at least two minutes apart), lengthening healthcare providers' viewing times for more accurate diagnoses
- ◆ Does not induce nausea or skin rashes like iodine-based agents can, increasing patient comfort





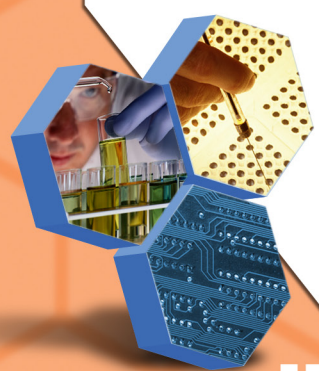
technology opportunity

Technology

Carbon dioxide has unique properties that make it particularly useful as a contrast agent in diagnostic imaging procedures. For example, CO₂ is non-allergenic and safe for patients with poor renal function. The main impediment to CO₂ angiography's widespread adoption, however, has been an inability to detect dangerous nitrogen and air contamination in carbon dioxide reservoirs. A University of Florida researcher has developed an optical spectrometer that is sensitive to infiltration by 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, perhaps allowing CO₂ angiograms to become the standard protocol for diagnostic imaging.

The Inventors

Ray G. Thomas is an Associate in Geology in the University of Florida's Department of Geological Sciences. He has more than 30 years' experience designing medical and scientific instrumentation. In 2005, Mr. Thomas was awarded a patent for an inexpensive, submersible, automatic water sampler that can be deployed directly into difficult-to-navigate bodies of water like vadose caves and water-filled conduits. He has also created many sensor and communication networks for remote data acquisition applications, such as those used by remote seismic stations.



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