UMASS BOSTON

Invention Available for Licensing *Life Sciences*

Title: ***Peltier-Cooled Cryogenic Laser Ablation Cell***

UMB13-04

Inventors: ***Robyn Hannigan, Ph.D., et al.***

Applications:

- Improved laser ablation cell
- Improved analysis of metals in biological samples

Benefits:

- Enhanced sensitivity in measuring metals in biological samples
- More precise temperature control of samples to be ablated

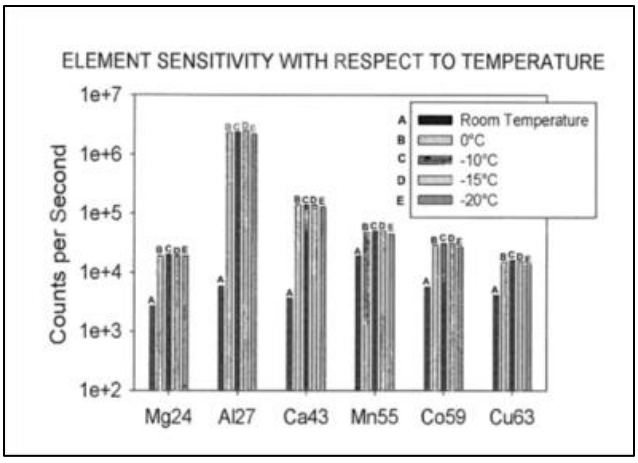
Technology Description:

Laser ablation is a standard sample introduction system that is coupled to elemental analyzers such as inductively coupled plasma mass spectrometers (ICP-MS). Lasers are used to ablate biological samples to detect and quantify elements such as biologically relevant metals. In many cases, the ablation cell is kept at ambient temperature, even though laser irradiance may lead to heating of the sample. Although this heating is minimal and of little analytical concern for analysis of solid homogeneous inorganic materials, it is a significant concern when analyzing biological material.

The inventors have solved this problem by developing a laser ablation cell that is maintained at -20^{o}C through the use of a Peltier-cooling system. Peltier-cooling, also referred to as thermoelectric cooling, exploits the Peltier effect to create a heat flux between the junction of two different types of materials. A Peltier cooler transfers heat from one side of a device to the other when current is applied, so that one side gets cooler while the other gets hotter. In the present invention, the inventors have utilized Peltier-cooling to create a laser ablation cell that provides greatly enhanced analytical signals of biologically relevant metals.

Patent and Publication Status:

UMass Boston has been awarded U.S. Patent No. 9,679,753 covering this invention. A European patent application is also pending.



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