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Applications of Hydrogen Gas Getters in Mass Spectrometer

The present invention is an electrically controlled getter device with a substrate comprising a metal alloy, where the substrate is in fluid communication with one or more pumps and the flow of a fluid is in contact with the metal alloy controlled by one or more microvalves positioned between a source of a fluid and the metal alloy. Gaseous materials are then adsorbed and selectively released on application of an electrical charge to the metal alloy. The device can be typically incorporated within a mass spectrometer, a small SEM, a vacuum pump, or similar portable devices. The mass spectrometer incorporating the present invention could be a quadrupole ion trap mass spectrometer comprised of either hyperbolic or cylindrical ring electrodes with one or more pumps of the present invention coated with a material that comprise a metal alloy, which may be selected from zirconium, vanadium, iron, cobalt, aluminum, rare earth metals, lanthanum, cerium, praseodymium, neodymium, or other combinations. The coating materials of the present invention will then react irreversibly with oxygen, carbon-dioxide, water vapor, and nitrogen, and react reversibly when adsorbing hydrogen and inert gases.

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