CLAIMS

1. A method for detecting or measuring trace levels of an acidic or basic airborne molecular contaminant in a gas stream, comprising:

passing a gas stream into the inlet through the flow path and out of the outlet of a liquid-free trap for trace levels of an acidic or basic airborne molecular contaminant in a gas, comprising:

a housing, comprising an inlet and an outlet;

a flow path between the inlet and the outlet; and

a rigid sintered hydrophilic material situated in the flow path between the inlet and the outlet and sealed in the housing, the rigid sintered hydrophilic material functionalized with from about 0.05 molar milliequivalents to about 10 molar milliequivalents of a basic species for trapping an acidic airborne molecular contaminant in the gas or from about 0.05 molar milliequivalents to about 10 molar milliequivalents of an acidic species for trapping a basic airborne molecular contaminant in the gas;

at a flow rate and for a period of time sufficient to trap a detectable quantity of the acidic or basic airborne molecular contaminant with the rigid sintered hydrophilic material;

desorbing the trapped acidic or basic airborne molecular contaminant from the rigid sintered hydrophilic material, thereby providing a sample; and

analyzing the sample for trace levels of the acidic or basic airborne molecular contaminant, thereby detecting or measuring trace levels of an acidic or basic airborne molecular contaminant in the gas stream,

wherein desorbing the trapped acidic or basic airborne molecular contaminant from the rigid sintered hydrophilic material comprises extracting the trapped acidic or basic airborne molecular contaminant from the rigid sintered hydrophilic material using a solvent,

wherein the solvent is water.