

ABSTRACT

A vacuum ultraviolet lamp (3) ionizes a chemical substance contained in exhaust gas Gs. The chemical substance ionized is trapped in an ion trapping apparatus (10) in which a radio frequency electric field is formed. Energy is applied to an ion group in the ion trapping apparatus (10) with a SWIFT waveform comprising a frequency component excluding a frequency corresponding to an orbital resonance frequency of ions of the chemical substance to remove an impurity. Energy is then applied to the ion group with a TICKLE waveform having a frequency component corresponding to the orbital resonance frequency of the ions of the chemical substance to fragmentate the ions of the chemical substance. A mass of the fragment is then measured with a mass spectrometer (4) to identify the chemical substance.



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