US 20240213012A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2024/0213012 A1

SUN et al. (43) Pub. Date: Jun. 27, 2024

(54) **ION GENERATOR, MASS SPECTROMETER AND METHOD OF GENERATING IONS**

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(21) Appl. No.: **18/541,196**

(22) Filed: **Dec. 15, 2023**

(30) **Foreign Application Priority Data**

Dec. 23, 2022 (CN) 202211666403.0

Publication Classification

(51) **Int. Cl.**
H01J 49/16 (2006.01)

(52) **U.S. Cl.**
CPC ***H01J 49/164*** (2013.01)

(57) **ABSTRACT**

The technical solution of the present disclosure provides an ion generator for dissociating sample ions for the second time by laser, of which the dissociation efficiency is further improved with a lower cost. The ion generator includes: a desorption device configured to desorb sample particles into a pre-determined area; a light source emitting a light beam and focusing the light beam to the pre-determined area, thereby ionizing, fragmenting or atomizing the sample particles in the pre-determined area; and a focusing reflector for reflecting the light beam that is emitted by the light source and travels through the pre-determined area, and focusing the light beam to the pre-determined area, thereby ionizing, fragmenting or atomizing the sample particles in the pre-determined area at least once again, during which each time the light beam is reflected on the surface of the focusing reflector, the light beam is focused to the pre-determined area correspondingly.