Title (en)

Method and facility for producing a radioisotope

Title (de)

Verfahren und Anlage für die Herstellung eines Radioisotops

Title (fr)

Procédé et installation pour la production d'un radioisotope

Publication

EP 2581914 B1 20141231 (FR)

Application

EP 11184551 A 20111010

Priority

EP 11184551 A 20111010

Abstract (en)

[origin: EP2581914A1] The method comprises irradiating a volume of precursory radioisotope fluid contained in a hermetic cell (14) of a target (12) using a beam of particles of a given current that is produced by a particle accelerator, cooling the target, and measuring an internal pressure in the hermetic cell, where the irradiation is interrupted or an intensity is reduced when the internal pressure in the hermetic cell leaves a first interval of tolerance determined according to various parameters affecting an evolution of the internal pressure in the hermetic cell during the irradiation. The method comprises irradiating a volume of precursory radioisotope fluid contained in a hermetic cell (14) of a target (12) using a beam of particles of a given current that is produced by a particle accelerator, cooling the target, and measuring an internal pressure in the hermetic cell, where the internal pressure in the hermetic cell is established during the irradiation and the irradiation is interrupted or an intensity is reduced when the internal pressure in the hermetic cell leaves a first interval of tolerance determined according to various parameters affecting an evolution of the internal pressure in the hermetic cell during the irradiation. The parameters for the target include a beam of particles, a precursory fluid of given radioisotope, a degree of filling of the hermetic cell, power of cooling of the target and a beam current. A curve providing the internal pressure of the hermetic cell for various currents of beam is determined for a given volume of precursory radioisotope fluid and a cooling power of the target. The first interval of tolerance presents a lower limit of pressure and an upper limit of pressure. The lower limit of internal pressure is defined to be 5-20% lower than a deduced value of pressure of the curve for the current beam. The upper limit of internal pressure is a pressure ranging between the deduced value of pressure of the curve and a value of pressure rating of the hermetic cell. The value of pressure rating is supposed to represent the value of maximum pressure for which the hermetic cell is guaranteed. The upper limit is 20% lower compared to the value of pressure rating of the hermetic cell. The upper limit is 5-10 bars higher than the deduced value of pressure of the curve and reached a maximum with a value of pressure lower than the value of pressure rating of the hermetic cell. A control device (28) sets off an alarm when the internal pressure in the hermetic cell leaves a second interval of tolerance defined according to various parameters affecting an evolution of the internal pressure in the hermetic cell during the irradiation. The second interval of tolerance is included in the first interval of tolerance. The second interval of tolerance presents a lower limit of pressure and an upper limit of pressure, where the lower limit of pressure is 2% lower than the value of pressure deduced of the curve for the current beam and higher than the lower limit of pressure of the first interval of tolerance, and the upper limit of pressure is higher than the deduced value of pressure of the curve and lower than the upper limit of pressure of the first interval of tolerance. The internal pressure in the hermetic cell exceeds an upper limit of internal pressure fixed inside first interval of tolerance, and the current of beam is decreased. An independent claim is included for an installation for producing a radioisotope.

IPC 8 full level

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CPC (source: EP US)

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