Gas targeting system for producing radioisotopes

The present application concerns a target holder system for producing radioisotopes by irradiating a gaseous target fluid under pressure by a beam of charged particles, in particular a high energy beam, that is to say at 1 MeV at least.

In nuclear medicine for example, positron emission tomography is an imaging technique requiring radioisotopes that emit positrons or molecules marked by those same radioisotopes.

To produce radioisotopes, a target holder system is installed at an exit of a particle accelerator.

A target holder system comprises for example one or more targets to irradiate. Each target comprises a radioisotope precursor which enables the corresponding radioisotope to be produced when the precursor has been irradiated. The target holder system is thus mounted at an exit of a particle accelerator with a target along an axis of the particle beam emitted by the accelerator. Thus the particle beam produced by the particle accelerator can irradiate the target of the target holder system to produce the radioisotope.

However, the target holder systems of the state of the art have various drawbacks.

The subject-matter of the present application is directed to providing an improved gas target holder system, moreover leading to other advantages.

To that end, according to a first aspect, there is provided a gas target holder system comprising:

- a body, which comprises:
  - a cavity configured to contain a target gas to irradiate with a particle beam emitted by a particle accelerator, the cavity comprising at least one portion of frusto-conical shape, a back closing a wide base of the portion of frusto-conical shape and an opening, opposite the back relative to the