

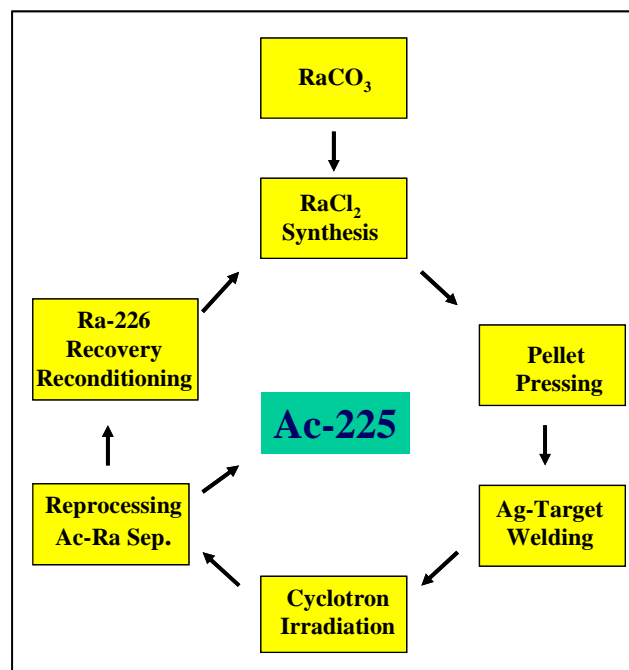
Method for producing Actinium-225

Description

This invention concerns a process for the production of Ac225 with deuteron irradiation of Ra226. The produced Ac225 is afterwards used as a generator of Bi213, which is of great interest in cancer therapy. The production process is based on the nuclear reaction $Ra226(d,3n)Ac225$. The cross section of this reaction is higher by 36% than the one of the commonly used $(p,2n)$ reaction, hence the production yield of Ac225 is also higher.

During the process, other actinium radionuclides are produced (Ac227, Ac226, Ac224) but in low concentration with respect to Ac225. Since their half-life is very short, Ac224 and Ac226 are eliminated by natural decay and Ac227 is produced in very low quantities. With respect to the irradiation with protons, an improvement of the Ac225 yield is estimated to 36%.

In order to perform the deuteron irradiation of the highly radiotoxic Ra226 in a cyclotron, the radium is introduced in an envelope made of Ag, Ti or Nb, placed in an Al capsule. The high thermal conductivity of Ag, Ti or Nb allows for a high current density during deuteron irradiation.



Areas of application

- Cancer therapy
- Alpha immunotherapy

Innovative aspects and main advantages

- Higher production yield
- No interfering side reactions
- Easiness of separation of Ra226 after reaction

Stages of development

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Scientific Contact

Dr. Christos Apostolidis
European Commission
Joint Research Centre, ITU
D-76125 Karlsruhe, Germany
Tel: +49 7247951 389
Email address: Christos.APOSTOLIDIS@ec.europa.eu

Licensing Contact

Intellectual Property and Scientific Collaboration Unit
DG JRC - European Commission
B-1049 Brussels, Belgium
Email: JRC-TechTransfer@ec.europa.eu

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