UNIVERSIDAD DE GRANADA | Oficina de Transferencia de Resultados de Investigación

CEIBioTIC GRANADA

NEUTRON BEAM PRODUCTION DEVICE FOR CANCER THERAPY

Researchers from the University of Granada have developed a neutron beam production device useful for neutron capture cancer therapies, and more particularly, for boron therapies. The present invention produces, moderates and shapes neutrons more adequately than existing designs, providing more appropriate and safer energy ranges for their therapeutic application.

Technology for Licensing

Keywords:

Beam Shape Assembly (BSA), neutron moderator, accelerator based neutron beams, boron neutron capture therapy, BNCT, cancer therapy.

Description:

Boron Neutron Capture Therapy (BNCT) is a type of experimental radiotherapy against cancer, with the uniqueness of being selective at the cellular level. It is based on the irradiation of the patient with neutrons, who has previously been administered a boron compound. Boron binds preferentially to cancer cells, so that when a neutron interacts with it, a nuclear reaction occurs that destroys or severely damages the cancer cell, leaving adjacent tissue cells with little damage.

To date, the energy sources used and the production reactions tested have resulted in higher energies than is required in a BNCT treatment. Therefore, a device (BSA) is necessary that adapts the neutrons produced to the therapeutic needs.

The invention consists of a device through which a proton beam is inserted, which interacts with a target to generate a neutron beam, a moderator that allows the neutrons to be brought up to energies in the epithermal range and a filtering stage that allows reducing the fast neutrons, thermal neutrons and gamma radiation.

After comparing the values obtained with those recommended by the International Atomic Energy Organization (IAEA) and with two of the main BNCT facilities it is demonstrated that thanks to the filtering stage, the device presented improves the previous designs and would be the answer to the problems and needs existing in the market.

Actuación en el marco del Proyecto ILIBERIS: Actuaciones Singulares de Transferencia de Conocimiento en el CEI BIOTIC. Objetivo prioritario OP.01 "Potenciar la investigación, el desarrollo tecnológico y la innovación"

UNIÓN EUROPEA
Fondo Europeo de Desarrollo Regional

Junta de Andalucía
Consejería de Transformación Económica, Industria, Conocimiento y Universidades

Andalucía se mueve con Europa

Advantages and Benefits

- A more suitable range of energies
- Less risk of side effects
- Greater security
- Larger efficacy in treatment
- Competitive cost. It requires fewer materials
- Necessary facilities:

  Highlight that it is easier to locate next to hospitals than other devices

Patent status:
Spanish Patent application number: P202030854
Priority date: 09/08/2020
Spanish Patent Office Search Report (IET) available.

PCT application number: PCT/ES2021/070607
International filing date: 09/08/2021

Contact:
Oficina de Transferencia de Resultados de Investigación (OTRI) - Universidad de Granada

patentes@ugr.es www.otri.ugr.es