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(71) Applicant(s):
NISHIZAWA Katsuya [JP/JP]; 515-2, Yoshida, Ueda-shi, Nagano 3861105 (JP) *(for all designated states)*

(72) Inventor(s):
NISHIZAWA Katsuya; 515-2, Yoshida, Ueda-shi, Nagano 3861105 (JP)

(54) Title (EN): MUON DECELERATION SYSTEM, NUCLEAR TRANSMUTATION SYSTEM, CONTAINER, AND DEVICE

(54) Title (FR): SYSTÈME DE DÉCÉLÉRATION DE MUONS, SYSTÈME DE TRANSMUTATION NUCLÉAIRE, RÉCIPIENT, ET DISPOSITIF

(54) Title (JA): ミュオン減速システム、核変換システム、容器、装置

(57) Abstract:

(EN): [Problem] A study of a system for the nuclear transmutation of starting material atomic nuclei using muons revealed the problem that when a target containing carbon atoms is used as a muon target, the carbon atoms are highly radioactivated via high-energy proton irradiation; thus, there is need for a system that suppresses the radioactivation of a muon target. It is also possible that muons, due to the high speed thereof, will not readily react with target starting material atoms. [Solution] Proposed is a system whereby high-speed muons/cosmic muons generated by a device or by cosmic rays are decelerated by means of an electric field/deceleration means and are bonded to starting material atoms. Proposed are a decelerator using a laser wakefield and a decelerator using an element that forms an electric field. Proposed is a container for a nuclear transmutation furnace. Proposed are a power generation system, battery, submarine, and aircraft/spacecraft/space structure/space exploration robot.

(FR): [Problème] Une étude d'un système pour la transmutation nucléaire de noyaux atomiques de matière de départ à l'aide de muons a révélé le problème selon lequel, lorsqu'une cible contenant des atomes de carbone est utilisée en tant que cible de muons, les atomes de carbone sont hautement radioactivés via une irradiation de protons à haute énergie; ainsi, il existe un besoin d'un système qui supprime la radioactivation d'une cible de muons. Il est également possible que des muons, en raison de leur grande vitesse, ne réagissent pas facilement avec des atomes de matière de départ cibles. [Solution] Il est proposé un système grâce auquel des muons/muons cosmiques à grande vitesse générés par un dispositif ou par des rayons cosmiques sont ralentis au moyen d'un champ électrique/moyen de décélération et sont liés à des atomes de matière de départ. L'invention concerne également un décélérateur qui fait appel à un laser wakefield et un décélérateur qui fait appel à un élément qui forme un champ électrique. L'invention concerne un récipient pour un four de transmutation nucléaire. L'invention concerne un système de génération d'énergie, une batterie, un sous-marin, et un aéronef/un engin spatial/une structure spatiale/un robot d'exploration spatiale.

(JA):【課題】ミュオンを用いて原料原子核を核変換するシステムを検討する。ミュオン標的に炭素原子を用いた標的を用いると炭素原子が高エネルギーの陽子照射を経て高度に放射化される問題があり、ミュオン標的が放射化しにくくなる系を考案したい。またミュオンは高速のため標的の原料原子と反応しにくい可能性もあった。【解決手段】装置や宇宙線により生成された高速なミュオン／宇宙ミュオンを電場・減速手段を用いて減速させ原料原子に結合させるシステムを考案する。レーザー航跡場を用いた減速器と電場を形成する素子を用いた減速器を提案する。核変換炉の容器を提案する。発電システム、電池、潜水艦、航空機・宇宙船・宇宙構造物・宇宙探査ロボット等を提案する。

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