Contribution ID: **135** Type: **Invited Presentation**

Production of N = 126 Nuclei and Beyond Using Multinucleon Transfer Reactions for KISS Project

Friday, 2 June 2017 14:50 (20 minutes)

Multinucleon transfer (MNT) reaction between two heavy ions at energies around the Coulomb barrier is considered as a promising candidate to produce and investigate exotic nuclei. It is expected to provide a mean to efficiently produce especially neutron-rich nuclei around the neutron magic number of 126, which is difficult to access by other production methods.
The nuclear region of the neutron magic number N = 126 has been attracting an astrophysical interest because it is the waiting point nuclei on the r-process path, which are considered as progenitors of the peak at the mass number of 195 in the solar r-abundance distribution.
We have constructed the KEK Isotope Separation System (KISS) at RIKEN RIBF facility to produce, separate and measure the nuclear properties of those neutron-rich nuclei around the neutron magic number N = 126, which will be produced by the MNT reaction. KISS consists of an argon gas cell based laser ion source and an isotope separation on-line (ISOL), to produce pure low-energy beams of neutron-rich isotopes around N = 126 and to study their beta-decay properties.
We adopted the reaction system of 136Xe + 198Pt, which is considered to be one of the best candidates to efficiently produce the nuclei of interest. In order to investigate the feasibility of the nuclear production of the system, we have studied the collisions between 136Xe and 198Pt at the laboratory energy of 8 MeV/nucleon by using the EXOGAM gamma-ray array coupled to the large acceptance magnetic spectrometer VAMOS++ at GANIL.
In this presentation, we will show the experimental results of nuclear production by the 136Xe + 198Pt reaction system, where the promising potential of the production of new isotopes around and beyond the neutron shell N = 126 by MNT reactions were demonstrated. We will discuss about the production of those nuclei using MNT reactions at KISS.

Primary author: Dr WATANABE, Yutaka (Wako Nuclear Science Center, Institute of Particle and Nuclear Studies, High Energy Accelerator Research Organization (KEK))

Co-authors: Mr MURAD, Ahmed (University of Tsukuba); Dr SCHMITT, Christelle (GANIL); Dr SUZUKI, Daisuke (IPN); Dr MONTANARI, Daniele (Padova University); Dr CLEMENT, Emmanuel (GANIL); Dr FIORETTO, Enrico (LNL); Prof. DE FRANCE, Gilles (GANIL); Prof. POLLAROLO, Giovanni (Torino University); Prof. MIYATAKE, Hiroari (Wako Nuclear Science Center, Institute of Particle and Nuclear Studies, High Energy Accelerator Research Organization (KEK)); Dr NISHIBATA, Hiroki (Department of Physics, Osaka University); Dr ISHIYAMA, Hironobu (Institute for Basic Science); Dr JUNG, Hyosoon (Wako Nuclear Science Center, Institute of Particle and Nuclear Studies, High Energy Accelerator Research Organization (KEK)); Dr SONG, Jeong Seog (Department of Physics and Astronomy, Seoul National University); Dr PARK, Jin Hyung (Institute for Basic Science); Mr TAKATSU, Jun (Department of Physics, Osaka University); Dr MOON, Jun Young (Institute for Basic Science); Prof. CORRADI, Lorenzo (LNL); Dr REJMUND, Maurycy (GANIL); Dr NIIKURA, Megumi (IPN); Prof. WADA, Michiharu (Wako Nuclear Science Center, Institute of Particle and Nuclear Studies, High Energy Accelerator Research Organization (KEK)); Mr OYAIZU, Michihiro (Wako Nuclear Science Center, Institute of Particle and Nuclear Studies, High Energy Accelerator Research Organization (KEK)); Ms MUKAI, Momo (University of Tsukuba); Prof. ALA-

HARI, Navin (GANIL); Prof. IMAI, Nobuaki (Center of Nuclear Science, University of Tokyo); Dr SCHURY, Peter (Wako Nuclear Science Center, Institute of Particle and Nuclear Studies, High Energy Accelerator Research Organization (KEK)); Prof. CHOI, Seonho (Department of Physics and Astronomy, Seoul National University); KIMURA, Sota (University of Tsukuba); Dr JEONG, Sun-chan (Institute for Basic Science); Dr HIRAYAMA, Yoshikazu (High Energy Accelerator Research Organization (KEK)); Dr KIM, Yung Hee (GANIL); Mr KAKIGUCHI, Yutaka (Wako Nuclear Science Center, Institute of Particle and Nuclear Studies, High Energy Accelerator Research Organization (KEK))

Presenter: Dr WATANABE, Yutaka (Wako Nuclear Science Center, Institute of Particle and Nuclear Studies, High Energy Accelerator Research Organization (KEK))