Accreditation No.: 571/AU2/P2MI-LIPI/07/2014
Accreditation No.: 36b/E/KPT/2016

atom indonesia

Exist for publishing the results of research and development in nuclear science and technology

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SIC No. B/289-PK/VI/75; 3.6.75

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atom indonesia
vol. 43 no. 1
April 2017

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EDITORIAL

Dear reader, with great pleasure we provide you with the first issue of Atom Indonesia in 2017, namely Volume 43, No.1 (2017). The number of articles submitted to Atom Indonesia has significantly increased for the past few years. Therefore, only the articles that fulfill our requirements and qualifications will become our priority. Atom Indonesia has been trying to improve its services by keeping publication timeline on time and also by providing articles in press by using the Digital Object Identifier (DOI) for each article.

As previously mentioned, Atom Indonesia has been indexed by Google Scholar, DOAJ, Crossref, ISJD, and IAEA INIS. By this indexing, it is expected that Atom Indonesia become better known among the researchers from around the world and easier to access, thus it would also increase the impact factor of the journal. Indonesian Institute of Science (LIPI) has approved our journal as one of the International Reputed Journals, besides reaccrediting it in the A category. Important news is that Atom Indonesia has been reaccredited by the Ministry of Research, Technology and Higher Education with the number of 36b/E/KPT/2016, with the highest mark (A). A further target of our journal is to be indexed by Scopus. Therefore, we have submitted the application to Scopus at the end of November 2015. Presently, this journal is under reviewed by Scopus. Further information on, and the full articles of, Atom Indonesia Vol.43 No.1 (2017) can be downloaded from http://aij.batan.go.id.

We are glad to inform you, that starting this year, the number of articles per issue has been increased from the originally seven to eight. The Atom Indonesia Vol. 43 No. 1 (2017) contains eight articles discussing various applications of nuclear science and technology, such as the use of x-ray diffraction and electron microscopy in nanomaterial characterization, experimental validation of reactor neutron spectrum, preparation of radiopharmaceuticals for both diagnostic and therapeutic purposes, influence of gamma irradiation on degradability of bagasse, behavior of artificial radioisotopes in the environment, use of radiation-induced chromosomal changes in bio-dosimetry, and estimation of effective diameters of computed tomography patients.

“Preparation and Characterization of Zirconia Nanomaterial as a Molybdenum-99 Adsorbent” was explored by Marlina and her colleagues from Center for Radioisotope and Radiopharmaceutical Technology, National Nuclear Energy Agency. The present study deals with the synthesis and characterization of ZrO_2 nanomaterial that can be used as an adsorbent for Molybdenum-99 (^{99}Mo). The adsorbent can potentially be utilized as the material for 99Mo/99mTc generator column. Using the sol-gel method, monoclinic nanocrystalline zirconia was synthesized from zirconium oxychloride in isopropyl alcohol reacted with ammonium hydroxide solution in isopropyl alcohol resulting in white gel.

“Experimental Validation of Ex-Vessel Neutron Spectrum by Means of Dosimeter Materials Activation Method" was written by S.A. Santa from Center for Nuclear Reactor Technology and Safety, National Nuclear Energy Agency. Neutron spectrum information in reactor core and around of ex-vessel reactor needs to be known with a certain degree of accuracy to support the development of fuels, materials, and other components. The most common method to determine neutron spectra is by utilizing the radioactivation of dosimeter materials. This report presents the evaluation of neutron flux incident on M3 dosimeter sets which were irradiated outside the reactor vessel, as well as the validation of neutron spectrum calculation.

The “Radiolabeled Antibody Fragment for Preparation of (^{177}Lu-DOTA)$_m$-PAMAM G3.0-F (ab’)$_2$-trastuzumab as a Radiopharmaceutical for Cancer Therapy” was explored by R.D. Haryuni, *et al*., from Center for Radioisotope and Radiopharmaceutical Technology, National Nuclear Energy Agency. Several radiolabeled monoclonal antibodies (mAbs) have been used as radio immunotherapy (RIT) agents for cancer therapy. The use of mAbs as RIT agents is due to their ability to carry effectors, in the form of radionuclides

which emit alpha (α) particles, beta (β) particles, or auger electrons, and bind specifically to cancer expressed receptor. This paper reports the preparation of radiolabelled trastuzumab in form of (^{177}Lu-DOTA)$_m$-PAMAM G3-F(ab')$_2$-trastuzumab, which will be expected as a potential RIT agent for therapy of breast cancer overexpressed human epidermal growth factor receptor 2 (HER2).

"Optimization of Electrodeposition Parameters to Increase ^{99m}Tc Radioactive Concentration" was written by M.B. Febrian, Y. Setiadi, and T.H.A. Wibawa from Center for Applied Nuclear Science and Technology, National Nuclear Energy Agency. The use of low activity concentration ^{99m}Tc would result in low-quality labeled compound for diagnostic purpose. The low activity concentration of labeled compound will alter biodistribution and lead to false imaging in diagnostic applications. Electrodeposition could be an alternative method for increasing the activity concentration of ^{99m}Tc solution. The influence of electrodeposition parameters such as type of electrolytes, concentration of electrolyte, and voltage and time of deposition were examined to find the optimum condition for electrodeposition.

T. Wahyono, N. Lelananingtyas, and Sihono from Center for Isotopes and Radiation Application, National Nuclear Energy Agency, showed their results on "Effects of Gamma Irradiation on Ruminal Degradation of Samurai 1 Sweet Sorghum Bagasse". The purpose of this study was to investigate the influence of gamma irradiation on dry matter, organic matter, and neutral detergent fiber degradability of Samurai 1 sweet sorghum bagasse, to facilitate its utilization in ruminant diets. Sorghum bagasse was obtained from Samurai 1 sorghum stem by-product after juice extraction. Gamma irradiation was carried out in a cobalt-60 irradiator in the Center for the Application of Isotopes and Radiation.

"Behavior of ^{137}Cs Activity in the Sayung Waters, Demak, Indonesia" was jointly investigated by Muslim from Department of Oceanography, Diponegoro University, Semarang, Indonesia, and H. Suseno and M.J. Pratiwi from Marine Radioecology Group, Center for Radiation Safety Technology and Metrology, National Nuclear Energy Agency. The behavior of anthropogenic radionuclide ^{137}Cs in the water and sediment has been examined with regard to particle size, organic sediment, and other physical conditions in the Sayung estuarine waters of Demak. Previously, this estuary was used as shrimp culture brackish water ponds that were affected by serious erosion and intrusion. Furthermore, this regency rapidly industrialized over the last three decades.

An "Assessment of Ionizing Radiation Induced Dicentric Chromosome and Micronuclei in Human Peripheral Blood Lymphocytes for Preliminary Reconstruction of Cytogenetic Biodosimetry", is an interesting article written a collaborative work among by M. Syaifudin, Y. Lusiyanti, S. Purnami from Center for Radiation Safety Technology and Metrology, National Nuclear Energy Agency, Y.S Lee from College of Pharmacy, Ewha Womans University, Seoul, South Korea, and C.M. Kang from Laboratory of Radiation Cytogenetics and Epidemiology, Korea Institute of Radiological and Medical Sciences (KIRAMS), Seoul, South Korea.

"The Evaluation of the Effective Diameter (D_{eff}) Calculation and its Impact on the Size-Specific Dose Estimate (*SSDE*)" is an interesting article resulting from a collaborative work between by C. Anam from Department of Physics, Diponegoro University, Semarang, Indonesia, F. Haryanto, R. Widita, and I. Arif from Department of Physics, Bandung Institute of Technology, Bandung, Indonesia, and G. Dougherty from Applied Physics and Medical Imaging, California State University Channel Islands, Camarillo, USA. Information on the effective diameter (D_{eff}) is essential for estimating the dose for patients undergoing CT examinations. The purpose of this study was to calculate the effective diameter using the maximum values of lateral (LAT) and anterior-posterior (AP) diameters ($D_{eff,m}$) and using LAT and AP diameters taken from the center of the image ($D_{eff,c}$), and compare both estimates to the effective diameter calculated directly from the cross-sectional area of the patient ($D_{eff,A}$).

Editor in Chief