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Contents

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EDITORIAL

Dear reader, with great pleasure we provide you the second issue of Atom Indonesia in 2019, namely Vol. 45 No. 2 (2019). Since Atom Indonesia was indexed by SCOPUS and Web of Science (WOS), the number of articles submitted to Atom Indonesia has significantly increased. To retain the quality of the publications, all articles submitted to Atom Indonesia are peer reviewed by qualified editors and reviewers and is supported by a professional administration team.

The Atom Indonesia Vol. 45 No. 2 (2019) contains eight articles discussing various aspects and applications of nuclear science and technology. The contributors of those articles are not only from various national institutions and universities, but also from international institutions.

"Calculation of Control Rods Reactivity Worth of RSG-GAS First Core Using Deterministic and Monte Carlo Methods" was explored by T. Surbakti, S. Pinem, and A. Hamzah from the Center for Nuclear Reactor Technology and Safety, National Nuclear Energy Agency of Indonesia, in collaboration with T.M. Sembiring, from the Center for Assessment of Nuclear Energy System, National Nuclear Energy Agency of Indonesia, and K. Nabeshima from the Fast Reactor Computer Engineering Department, Ibaraki, JAEA, Japan. The control rod worth is a key parameter for the research reactor operation and utilization. Control rods worth computation is a challenge for the full deterministic and probabilistic calculations methodology, including the few group cross section generation, and the core analysis. The safe and reliable utilization of research reactor demands the possible accurate information of control rod worth as they are used to compensate the excess reactivity for safe reactor operation and it controls the shut down procedure. The criticality positions of the control rods change with time due to the build up fission products during the reactor operation. It is therefore, important to determine the reactivity worth of control rods. The aim of this article is to estimate the reactivity worth of controls rods in the first core of RSG-GAS reactor (MTR type).

"Release of Radioactive Particulates into the Air during Forest Fire in Riau Province, Indonesia" was written by Syarbaini from Center for Radioisotopes and Radiopharmaceuticals Technology, National Nuclear Energy Agency, Kawasan Puspiptek, Serpong, Indonesia, in collaboration with Makhsun and Wahyudi from the Center for Radiation Safety Technology and Metrology, National Nuclear Energy Agency, Jakarta, Indonesia and Syahrial and Jasmiyati from the Air Laboratory, Environmental Agency of Pekanbaru City Pekanbaru, Indonesia. Forest fires are annual problems during the dry season and these problems become the biggest threat to forest resources in Indonesia. The forest fires release large quantities of particulate matter and volatilized substances into the atmosphere. This article investigates effects of forest fire on air quality in the case of a radiological event of ashes emitted from forest fires in Riau province during an intense forest fire season that occurred in 2015.

"Sediment Sources Analysis Using CSSI Method in Pasir Buncir Micro-watershed, Bogor, Indonesia" was written by B. Aliyanta and P. Sidauruk from the Center for Isotopes and Radiation Application, National Nuclear Energy Agency of Indonesia. There is an increasing need for reliable information concerning the source of the suspended sediment transported by rivers. Such information is required both to design effective sediment and non-point pollution control strategies and to provide an improved understanding of erosion and suspended sediment transport within a watershed. In some situations, there are many developing methods of fingerprinting to determine the contribution of sediment sources via the streambed sediment. In this study, compound-specific stable isotope (CSSI) fingerprint has been used to determine sediment source contribution in Pasir Buncir micro-watershed, Bogor, West Java.

"The Effects of External Magnetic Field on the Physical Properties of $La_{0.41}Ca_{0.59}Mn_{1-x}Cu_xO_3$ with $x = 0.06$ and 0.15 in the Temperature Range of 100 – 300 K" was explored by Y.E. Gunanto from the Dept. of Physics Education, University of Pelita Harapan, Karawaci, Tangerang, Indonesia, in collaboration with

W.A. Adi from the Center for Science and Technology of Advanced Materials, National Nuclear Energy Agency of Indonesia, B. Kurniawan from the Dept. of Physics, University of Indonesia, A. Purwanto from the Dept. of Physics, STKIP Surya, Tangerang, Indonesia, T. Ono from the Department of Physics, Osaka Prefecture University, Sakai, Osaka, Japan, H. Tanaka from the Department of Physics, Tokyo Institute of Technology, Meguro-ku, Tokyo, Japan, and E. Steven from the Dept. of Physics, National High Magnetic Field Lab., Tallahase, Florida, USA. This work investigated the crystal structure, resistivity and specific heat of $La_{0.41}Ca_{0.59}Mn_{1-x}Cu_xO_3$ with x = 0.06 and 0.15. The samples were prepared by a solid reaction method and in milling with high energy milling (HEM) of 700 rpm for ten hours. Neutron Scattering with High resolution powder diffraction (HRPD) is used to analyze the phase and crystal structure. For resistivity analysis, four point probes are used, and SQUID Quantum Design is used for specific heat analysis in the temperature range of 100 - 300 K. In all cases, the sample has an orthorhombic crystal structure with a space group *Pnma*.

"Expression of γ-H2AX, 53BP1 and Micronuclei as Genome Damage Biomarker of Population in Keang and Salumati Village, Mamuju West Sulawesi Province" was explored by A.D. Pratiwi and Y.U. Anggraito from the Department of Biology, Faculty of Mathematics and Sciences, Semarang State University, Semarang, Indonesia, under collaboration with I.K.H. Basri, S. Purnami, M. Syaifudin, D. Tetriana, D. Yusuf, T. Rahardjo, S. Nurhayati, and N. Rahajeng from the Center for Radiation Safety Technology and Metrology, National Nuclear Energy Agency, Jakarta, Indonesia, and I. Kashiwakura from the Hirosaki University Graduate School of Health Sciences, Department of Radiological Life Sciences, Hirosaki, Japan. The residents living in high background radiation area have risk to be exposed by ionizing radiation that also potentially causes their DNA damage. The aim of this study was to determine the expression of γ-H2AX, 53BP1 foci and micronuclei in the residents who live in high background radiation area of Salumati village, Mamuju, West Sulawesi, Indonesia. Twenty one blood samples, which consist of 11 from the study area and 10 from control were assessed for their expression of γ-H2AX and 53BPI foci by using specific antibodies and observed under fluorescence microscope, whereas micronuclei was detected after being cultured and giemsa stained according to standard procedures.

"Application of Digital Anti-Coincidence Counting Method For Primary Activity Determination of ^{59}Fe" was explored by A. Agusbudiman from the Center for Technology of Radiation Safety and Metrology, National Nuclear Energy Agency, Jakarta, Indonesia, in collaboration with K.B. Lee, from the Korea Research Institute of Standards and Science, Daejeon, Republic of Korea and J.M. Lee, from the Korea University of Science and Technology, Daejeon, Republic of Korea. As a radiopharmaceutical, the use of ^{59}Fe is classified as a high pharmaceutical risk product. Therefore, a standard reference for activity measurement of ^{59}Fe is necessary to ensure its metrological aspect. This paper describes an alternative method for primary activity determination of ^{59}Fe for establishing a standard reference.

"Current Status and Recent Achievements of the Sterile Insect Technique Program Against Dengue Vector, *Aedes aegypti*, in Indonesia" was written by B. Ernawan, H.I. Sasmita, M. Sadar, and I. Sugoro from the Center for Isotopes and Radiation Application, National Nuclear Energy Agency of Indonesia. Given the facts that Indonesia has suitable environment condition to survival, reproduction and development of the principal mosquito vector for dengue virus, *Aedes aegypti*, the transmission of dengue virus does routinely occur every year. The sterile insect technique (SIT) as one of the techniques in area-wide integrated pest management (AW-IPM) has been developed to control *Aedes aegypti* population since 2004. The first 5 years of the program (2004-2009) was focused on mass rearing facility establishment. The lab-work study for the entomological data and field trials were performed in 2010-2014.

"Assessment of Ionizing Radiation Effects on the Hematological Parameters of Radiation-Exposed Workers" was written by H.N.E. Surniyantoro, T. Rahardjo, Y. Lusiyanti, N. Rahajeng from the Center for Radiation Safety Technology and Metrology, National Nuclear Energy Agency of Indonesia, under collaboration with A.H. Sadewa, and P. Hastuti from the Department of Biochemistry, Faculty of Medicine, Universitas Gadjah Mada, Yogyakarta, Indonesia and H. Date from the Faculty of Health Sciences,

Hokkaido University, Kitaku, Japan. Long-term exposure to low doses of ionizing radiation may adversely affect human cells and tissues of hospital radiation workers, especially peripheral blood cell count. Blood cell count analysis is a useful screening test in a routine medical checkup. A high or low blood cells count even in a healthy-looking subject leads to the suspicion of disease and it should prompt further investigations. This study was aimed to assess the effects of ionizing radiation on the hematological parameters of radiation workers at several governmental hospitals in Indonesia and correlation between years of employment and equivalent dose on one hand and the hematological parameters on the other. It included 74 medical radiation workers occupationally exposed to low doses of ionizing radiation at the Unit of Radiology and Radiotherapy and 83 controls. Fourteen hematological parameters were measured by ABX Micros 60 Hematology analyzer and the correlation between years of employment and equivalent dose as well as hematological parameters on radiation-exposed workers were tested by linear regression analysis test.

On behalf of Atom Indonesia, I would like to thank you all for all of your contributions and endless support that have allowed Atom Indonesia to reach an outstanding performance for all the years. This outstanding achievement could not have been reached without great efforts and cooperation from the editors, reviewers, management personnel, authors, and readers.

Editor in Chief