



## BIBLIOGRAPHY

- [1] IAEA. *Feasibility of Producing Molybdenum-99 on a Small Scale Using Fission of Low Enriched Uranium or Neutron Activation of Natural Molybdenum*. Number 478 in Technical Reports Series. International Atomic Energy Agency, Vienna, 2015. Accessed from <https://www.iaea.org/publications/10599/feasibility-of-producing-molybdenum-99-on-a-small-scale-using-fission-of-low-enriched-uranium-or-neutron-activation-of-natural-molybdenum>.
- [2] Syarip, P. I. Wahyono, W. Susilo and K. Donny. “Commissioning preparation of a subcritical experimental facility for 99Mo production”. *Journal of Physics: Conference Series*, 1198(2):022023, 4 2019. Accessed from <https://dx.doi.org/10.1088/1742-6596/1198/2/022023>.
- [3] N.D.A. Anggraini, Suharyana, Riyatun and A. Khakim. “Criticality analysis of kartini reactor connected to test facility of subcritical assembly molybdenum-99 production (SAMOP)”. *Journal of Physics: Conference Series*, 1153, 2 2019. Accessed from <https://dx.doi.org/10.1088/1742-6596/1153/1/012105>.
- [4] A. Khakim. “Regulatory assessment on a new utilization of SAMOP test facility: Determination on fission power”. *Journal of Physics: Conference Series*, 1198, 5 2019. Accessed from <https://dx.doi.org/10.1088/1742-6596/1198/2/022027>.
- [5] Syarip, E. Togatorop and Yassar. “Molybdenum99 production calculation analysis of SAMOP reactor based on thorium nitrate fuel”. *Journal of Physics: Conference Series*, 978:012072, 3 2018. Accessed from <https://doi.org/10.1088/1742-6596/978/1/012072>.
- [6] D. P. Hermawan, Rionaldy and Syarip. “Neutronic analysis of SAMOP reactor experimental facility using SCALE code system”. *Journal of Physics: Conference Series*, 1090(1):012032, 9 2018. Accessed from <https://dx.doi.org/10.1088/1742-6596/1090/1/012032>.
- [7] M. I. Farezza W and Syarip. “Mo99 isotope production calculation of SAMOP reactor experimental facility”. *Journal of Physics: Conference Series*, 1090(1):012013, sep 2018. Accessed from <https://dx.doi.org/10.1088/1742-6596/1090/1/012013>.
- [8] Badan Riset Indonesia. Irl brin - reaktor kartiniinternet reactor laboratory. Accessed from <https://irlkartini.batan.go.id/>. Accessed on 07-04-2023.
- [9] N. Soppera, M. Bossant and E. Dupont. “JANIS 4: An improved version of the NEA java-based nuclear data information system”. *Nuclear Data Sheets*, 120:294–296, 2014. Accessed from <https://doi.org/10.1016/j.nds.2014.07.071>.



- [10] S. Hasan and M.A. Prelas. “Molybdenum-99 production pathways and the sorbents for Mo99/Tc99m generator systems using (n,  $\gamma$ ) Mo99: a review”. *SN Applied Sciences*, 2(11):1782, Oct 2020. Accessed from <https://doi.org/10.1007/s42452-020-03524-1>.
- [11] IAEA. *Non-HEU Production Technologies for Molybdenum-99 and Technetium-99m*. Number NF-T-5.4 in Nuclear Energy Series. International Atomic Energy Agency, Vienna, 2013. Accessed from <https://www.iaea.org/publications/10386/non-heu-production-technologies-for-molybdenum-99-and-technetium-99m>.
- [12] G.L.C.R. Conturbia, M. Durazzo, E.F. Urano de Carvalho and H.G. Riella. “Phase quantification in UAl<sub>x</sub>-Al dispersion targets for Mo99 production”. *Journal of Nuclear Materials*, 509:465–477, 2018. Accessed from <https://doi.org/10.1016/j.jnucmat.2018.07.029>.
- [13] B. Briyatmoko, Boybul, Guswardani, Suhardyo, Purwanta, S. Permana, Dadang, Basiran and M. Kartaman. “Indonesia’s current status for conversion of Mo99 production to LEU fission”. *2007 International RERTR Meeting*, 2008. Accessed from <https://api.semanticscholar.org/CorpusID:134008796>.
- [14] M. Al Hasa and A. Suripto. “Pelapisan foil uranium target engan Ni dan Zn secara electroplating”. *Jurnal Sains Materi Indonesia*, 2(3):12–18, 2019. Accessed from <https://jurnal.batan.go.id/index.php/jsmi/article/view/4895>.
- [15] S. Pinem, T.M. Sembiring, Tukiran and I. Kuntoro. “Neutronic analysis on irradiation of the LEU electroplating target in the RSG-GAS reactor for production of 99Mo radionuclide”. *Jurnal Iptek Nuklir Ganendra*, 21(2):55–61, 2018. Accessed from [http://inis.iaea.org/search/search.aspx?orig\\_q=RN:50043291](http://inis.iaea.org/search/search.aspx?orig_q=RN:50043291).
- [16] S-K. Lee, S. Lee, M. Kang, K. Woo, S. Woo Yang and J. Lee. “Development of fission 99Mo production process using HANARO”. *Nuclear Engineering and Technology*, 52(7):1517–1523, 2020. Accessed from <https://doi.org/10.1016/j.net.2019.12.019>.
- [17] L. H. Pardo, D. M. Pérez, D. M. Pérez, D. E. M. Lorenzo and C. A. B. O Lira. “Coupled multi-physics simulation for the evaluation of an accelerator-driven aqueous homogeneous subcritical system for medical isotope production”. *Progress in Nuclear Energy*, 134:103692, 2021. Accessed from <https://doi.org/10.1016/j.pnucene.2021.103692>.
- [18] P. P. Boldyrev, V. S. Golubev, S. V. Myasnikov, A. K. Pavlov, N. V. Petrunin, V. A. Pavshook, P. L. Garner, R. M. Lell, A. M. Tenter and N. A. Hanan. “The russian ARGUS solution reactor HEU-LEU conversion: LEU fuel preparation, loading and first criticality”. 10 2014. Accessed from <https://www.osti.gov/biblio/1358611>.



- [19] S. V. Myasnikov, A. K. Pavlov, N. V. Petrunin and V. A. Pavshook. “Conversion of the ARGUS solution reactor to LEU fuel: results of feasibility studies and schedule”. *Proceedings of the 34th International Meeting on Reduced Enrichment for Research and Test Reactors (RERTR'12)*, hal. 8, 2012. Accessed from <https://www.osti.gov/servlets/purl/1358611>.
- [20] G. R. Piefer, K. M. Pitas, E. N. Van Abel, T. R. Mackie, T. A. Heltemes, R. V. Bynum, T. T. Gribb and R. F. Radel. “Mo99 production using a subcritical assembly”. *Proceedings of the 1st Annual Mo99 Topical Meeting*, 2011. Accessed from [https://mo99.ne.anl.gov/2011/pdfs/Mo99%202011%20Web%20Papers/S6-P3\\_Piefer-Paper.pdf](https://mo99.ne.anl.gov/2011/pdfs/Mo99%202011%20Web%20Papers/S6-P3_Piefer-Paper.pdf).
- [21] IAEA. *Homogeneous Aqueous Solution Nuclear Reactors for the Production of Mo99 and other Short Lived Radioisotopes*. Number 1601 in TECDOC Series. International Atomic Energy Agency, Vienna, 2008. Accessed from <https://www.iaea.org/publications/7994/homogeneous-aqueous-solution-nuclear-reactor-s-for-the-production-of-mo-99-and-other-short-lived-radioisotopes>.
- [22] G. Abrar, Sihana and Syarip. “Conversion ratio analysis of CAMOLYP reactor design concept”. *Nuclear Engineering and Design*, 383:111428, 2021. Accessed from <https://doi.org/10.1016/j.nucengdes.2021.111428>.
- [23] D. Bartolomeus and Syarip. “Analysis of Mo99 production as function of CAMOLYP reactor power”. *Journal of Physics: Conference Series*, 1568(1):012018, 06 2020. Accessed from <https://doi.org/10.1088/1742-6596/1568/1/012018>.
- [24] A. Tesalonika, A. W. Harto, Y. Sardjono and I. M. Triatmoko. “Dosimetry of in vitro and in vivo trials in thermal column kartini reactor for boron neutron capture therapy (BNCT) facility by using MCNPX simulator code”. *Indonesian Journal of Physics and Nuclear Application*, 2016. Accessed from <https://doi.org/10.24246/ijpna.v1i2.63-72>.
- [25] BATAN and Syarip et.al. Perangkat reaktor subkritik untuk produksi Mo99 (SAMOP: Subcritical assembly for molybdenum-99 productions), 2005. Accessed from <http://e-statushki.dgip.go.id/index.php/penelusuran/paten/P00200500760>. Patent No.: P00200500760.
- [26] T. Setiadipura and E. Saragi. “Neutronic aspect of subcritical assembly for Mo99 production (SAMOP) reactor”. *International Conference on Advances in Nuclear Science and Engineering in Conjunction with LKSTN 2007*, 10 2007. Accessed from <https://www.researchgate.net/publication/242424106>.
- [27] R. F. Isdandy, Syarip, Silakhuddin, W. Kurnia and Suharni. “Neutronic analysis of DECY-13 cyclotron target system as a neutron source for SAMOP”. *Journal of Physics: Conference Series*, 1436, 2 2020. Accessed from <https://doi.org/10.1088/1742-6596/1436/1/012016>.



- [28] L. Wahid, M.I.W. Farezza and Syarip. "Source term analysis of SAMOP reactor experimental facility". *Journal of Physics: Conference Series*, 1090, 9 2018. Accessed from <https://doi.org/10.1088/1742-6596/1090/1/012031>.
- [29] D. S. Pudjorahardjo, P. I. Wahyono and Syarip. "Compact neutron generator as external neutron source of subcritical assembly for Mo99 production (SAMOP)". *AIP Conference Proceedings*, 2296, 11 2020. Accessed from <https://doi.org/10.1063/5.0030345>.
- [30] Syarip and Z. Abidin. "Set-up of prompt gamma neutron activation analysis system at kartini reactor". *Journal of Physics: Conference Series*, 1080(1):012030, 8 2018. Accessed from <https://doi.org/10.1088/1742-6596/1080/1/012030>.
- [31] Syarip and T. Sutondo. "Analytical method of atomic density determination of uranyl nitrate solution". *Journal of Physics: Conference Series*, 1090(1):012036, 7 2018. Accessed from <https://doi.org/10.1088/1742-6596/1090/1/012036>.
- [32] P. I. Wahyono and S. Syarip. "Analisis produksi 99Mo berbasis waktu iradiasi larutan uranil nitrat pada fasilitas reaktor Kartini". *Risalah Fisika*, 4(1):15–18, 2020. Accessed from <https://journal.fisika.or.id/index.php/rf/article/view/172>.
- [33] P I Wahyono and Syarip. "Analysis of uranyl nitrate hexahydrate composition for optimum neutron multiplication factor of SAMOP". *Journal of Physics: Conference Series*, 1402(4):044071, dec 2019. Accessed from <https://doi.org/10.1088/1742-6596/1402/4/044071>.
- [34] J. D. Burns and B. A. Moyer. "Uranyl nitrate hexahydrate solubility in nitric acid and its crystallization selectivity in the presence of nitrate salts". *Journal of Cleaner Production*, 172:867–871, 2018. Accessed from <https://doi.org/10.1016/j.jclepro.2017.10.258>.
- [35] Z. Duan, Y. Zhao, L. Lu, W. Li, Y. Li, Y. Jiao, Y. Xin, Tao Lei and Y. Peng. "Overview of performances and service behaviors of uranyl nitrate solution for medical aqueous homogeneous reactors". *Progress in Nuclear Energy*, 157:104591, 2023. Accessed from <https://doi.org/10.1016/j.pnucene.2023.104591>.
- [36] G. E. Winter, C. M. Cooling and M. D. Eaton. "Linear energy transfer of fission fragments of  $^{235}\text{U}$  and nucleation of gas bubbles in aqueous solutions of uranyl nitrate". *Annals of Nuclear Energy*, 142:107379, 2020. Accessed from <https://doi.org/10.1016/j.anucene.2020.107379>.
- [37] A. J. Youker, S. D. Chemerisov, M. Kalensky, P. Tkac, D. L. Bowers and G. F. Vandegrift. "A solution-based approach for Mo99 production:



Considerations for nitrate versus sulfate media”. *Science and Technology of Nuclear Installations*, 2013:402570, Sep 2013. Accessed from <https://doi.org/10.1155/2013/402570>.

- [38] S. Pomme. “Neutron activation analysis with K0-standardisation”. hal. 112–113, 2001. Accessed from [http://inis.iaea.org/search/search.aspx?orig\\_q=RN:32053181](http://inis.iaea.org/search/search.aspx?orig_q=RN:32053181). INIS-BE-0003.
- [39] R. R. Greenberg, P. Bode and E. A. De Nadai Fernandes. “Neutron activation analysis: A primary method of measurement”. *Spectrochimica Acta Part B: Atomic Spectroscopy*, 66(3):193–241, 2011. Accessed from <https://doi.org/10.1016/j.sab.2010.12.011>.
- [40] D.A. Brown, M.B. Chadwick, R. Capote, A.C. Kahler, A. Trkov, M.W. Herman, A.A. Sonzogni, Y. Danon, A.D. Carlson, M. Dunn, D.L. Smith, G.M. Hale, G. Arbanas, R. Arcilla, C.R. Bates, B. Beck, B. Becker, F. Brown, R.J. Casperson, J. Conlin, D.E. Cullen, M.-A. Descalle, R. Firestone, T. Gaines, K.H. Guber, A.I. Hawari, J. Holmes, T.D. Johnson, T. Kawano, B.C. Kiedrowski, A.J. Koning, S. Kopecky, L. Leal, J.P. Lestone, C. Lubitz, J.I. Márquez Damián, C.M. Mattoon, E.A. McCutchan, S. Mughabghab, P. Navratil, D. Neudecker, G.P.A. Nobre, G. Noguere, M. Paris, M.T. Pigni, A.J. Plompen, B. Pritychenko, V.G. Pronyaev, D. Roubtsov, D. Rochman, P. Romano, P. Schillebeeckx, S. Simakov, M. Sin, I. Sirakov, B. Sleaford, V. Sobes, E.S. Soukhovitskii, I. Stetcu, P. Talou, I. Thompson, S. van der Marck, L. Welser-Sherrill, D. Wiarda, M. White, J.L. Wormald, R.Q. Wright, M. Zerkle, G. Žerovník and Y. Zhu. “ENDF/B-VIII.0: The 8th major release of the nuclear reaction data library with CIELO-project cross sections, new standards and thermal scattering data”. *Nuclear Data Sheets*, 148:1–142, 2018. Accessed from <https://doi.org/10.1016/j.nds.2018.02.001>. Special Issue on Nuclear Reaction Data.
- [41] M.-M. Bé, V. Chisté, C. Dulieu, M.A. Kellett, X. Mougeot, A. Arinc, V.P. Chechev, N.K. Kuzmenko, T. Kibédi, A. Luca and A.L. Nichols. *Table of Radionuclides*, volume 8 of *Monographie BIPM-5*. Bureau International des Poids et Mesures, Pavillon de Breteuil, F-92310 Sèvres, France, 2016. Accessed from [http://www.bipm.org/utils/common/pdf/monographieRI/Monographie\\_BIPM-5\\_Tables\\_Vol8.pdf](http://www.bipm.org/utils/common/pdf/monographieRI/Monographie_BIPM-5_Tables_Vol8.pdf).
- [42] International Atomic Energy Agency. Iaea-nuclear data service. Accessed from <https://www-nds.iaea.org/relnsd/vcharthtml/VChartHTML.html>. Accessed on 07-04-2023.
- [43] A. G. Krigens. “Compilation of physical and chemical properties of materials and streams encountered in the chemical processing department.”. 1 1968. Accessed from <https://www.osti.gov/biblio/4800269>.



- [44] H. L. Clever. *IUPAC Solubility Data Project 1973 - 2001*, volume 55. 2004. Accessed from <https://srdata.nist.gov/solubility/IUPAC/SDS-55/SDS-55.pdf>.
- [45] M. Berger, J Hubbell, S. Seltzer, J. Coursey and D. Zucker. XCOM: Photon cross section database (version 1.2), 1999-01-01 1999. Accessed from <http://physics.nist.gov/xcom>.
- [46] D. Arnold, K. Debertin, A. Heckel, G. Kanisch, H. Wershofen and C. Wilhelm. *Fundamentals of Gamma Spectrometry*. Bibliothek Forschung und Praxis, 3 2018. Accessed from [https://www.bmuv.de/fileadmin/Daten\\_BMU/Download\\_PDF/Strahlenschutz/Messanleitungen\\_2022/gamma\\_spekt\\_grundl\\_v2018-03\\_en\\_bf.pdf](https://www.bmuv.de/fileadmin/Daten_BMU/Download_PDF/Strahlenschutz/Messanleitungen_2022/gamma_spekt_grundl_v2018-03_en_bf.pdf).
- [47] W. Johnson, E. Chan, E. Walsh, C. Morte, D. Lee and USDOE. InterSpec v.1.0.8, Version 1.0.8, 4 2021. Accessed from <https://www.osti.gov/biblio/1833849>.
- [48] Feryantama Putra, Syarip Syarip and Sihana Sihana. “Irradiation and analysis of uranyl nitrate solutions in different uranium concentrations for use in subcritical reactors for 99Mo production”. *Nuclear Engineering and Design*, 415:112701, 2023. Accessed from <https://doi.org/10.1016/j.nucengdes.2023.112701>.
- [49] M. Sri, Roto, A. Taftazani, M. Rina and Sutisna. “Analysis and measurement of kartini reactor parameters for application of K0-NAA method”. *J. Tek. Reaktor Nukl.*, 16(2):100–108, 2014. Accessed from <https://jurnal.batan.go.id/index.php/tridam/article/view/1852/1749>.
- [50] P. K. Romano, N. E. Horelik, B. R. Herman, A. G. Nelson, B. Forget and K. Smith. “OpenMC: A state-of-the-art monte carlo code for research and development”. *Annals of Nuclear Energy*, 82:90–97, 2015. Accessed from <https://doi.org/10.1016/j.anucene.2014.07.048>.
- [51] S. Agostinelli, J. Allison, K. Amako, J. Apostolakis, H. Araujo, P. Arce, M. Asai, D. Axen, S. Banerjee, G. Barrand, F. Behner, L. Bellagamba, J. Boudreau, L. Broglia, A. Brunengo, H. Burkhardt, S. Chauvie, J. Chuma, R. Chytracek, G. Cooperman, G. Cosmo, P. Degtyarenko, A. Dell’Acqua, G. Depaola, D. Dietrich, R. Enami, A. Feliciello, C. Ferguson, H. Fesefeldt, G. Folger, F. Foppiano, A. Forti, S. Garelli, S. Giani, R. Giannitrapani, D. Gibin, J.J. Gómez Cadenas, I. González, G. Gracia Abril, G. Greeniaus, W. Greiner, V. Grichine, A. Grossheim, S. Guatelli, P. Gumplinger, R. Hamatsu, K. Hashimoto, H. Hasui, A. Heikkinen, A. Howard, V. Ivanchenko, A. Johnson, F.W. Jones, J. Kallenbach, N. Kanaya, M. Kawabata, Y. Kawabata, M. Kawaguti, S. Kelner, P. Kent, A. Kimura, T. Kodama, R. Kokoulin, M. Kossov, H. Kurashige, E. Lamanna, T. Lampén, V. Lara, V. Lefebure, F. Lei, M. Liendl, W. Lockman, F. Longo, S. Magni, M. Maire, E. Medernach, K. Minamimoto, P. Mora de Freitas, Y. Morita, K. Murakami, M. Nagamatu,



R. Nartallo, P. Nieminen, T. Nishimura, K. Ohtsubo, M. Okamura, S. O’Neale, Y. Oohata, K. Paech, J. Perl, A. Pfeiffer, M.G. Pia, F. Ranjard, A. Rybin, S. Sadilov, E. Di Salvo, G. Santin, T. Sasaki, N. Savvas, Y. Sawada, S. Scherer, S. Sei, V. Sirotenko, D. Smith, N. Starkov, H. Stoecker, J. Sulkimo, M. Takahata, S. Tanaka, E. Tcherniaev, E. Safai Tehrani, M. Tropeano, P. Truscott, H. Uno, L. Urban, P. Urban, M. Verderi, A. Walkden, W. Wander, H. Weber, J.P. Wellisch, T. Wenaus, D.C. Williams, D. Wright, T. Yamada, H. Yoshida and D. Zschiesche. “GEANT4 a simulation toolkit”. *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*, 506(3):250–303, 2003. Accessed from [https://doi.org/10.1016/S0168-9002\(03\)01368-8](https://doi.org/10.1016/S0168-9002(03)01368-8).

- [52] ORTEC. Ortec GEM series coaxial HPGe radiation detectors, 2021. Accessed from <https://www.ortec-online.com/-/media/ametekortec/brochures/g/gem.pdf?la=en&revision=ae7caf09-b98c-4a33-a092-b43edb472666>. Diakses 07-04-2023.
- [53] F. Panuntun, Siswanti, J. B. Utami and M. Salam. “Validation of HPGe efficiency modeling by MCNP5 for volume source”. *AIP Conference Proceedings*, 2381(1), 11 2021. Accessed from <https://doi.org/10.1063/5.0066902>. 020056.
- [54] R.H.M. Tsang, A. Piepke, D.J. Auty, B. Cleveland, S. Delaquis, T. Didberidze, R. MacLellan, Y. Meng, O. Nusair and T. Tolba. “GEANT4 models of HPGe detectors for radioassay”. *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*, 935:75–82, 2019. Accessed from <https://doi.org/10.1016/j.nima.2019.04.085>.
- [55] K. S. Kim. “Specification for the VERA depletion benchmark suite”. 12 2015. Accessed from <https://www.osti.gov/biblio/1256820>.