

## ЛИТЕРАТУРА

- [1] Ramos A.R. et al. Measurement of (p,p) elastic differential cross-sections for carbon, nitrogen, oxygen, aluminium and silicon in the 500–2500 keV range at 140° and 178° laboratory scattering angles // Nucl. Instr. Meth. in Phys. Res. - 2002. V.B190. - P.95-99.
- [2] Gomes V., Douglas R.A., Polga T. and Sala O. The  $E_p = 2.66$  MeV resonance in  $^{16}\text{O}(p, p)^{16}\text{O}$  // Nucl. Phys. - 1965. V.A68. - P.417-425.
- [3] Chow H.C., Griffithsa G.M., Hall T.H. The  $^{16}\text{O}(p, \gamma)^{17}\text{F}$  Direct Capture Cross Section with an Extrapolation to Astrophysical Energies // Can. J. Phys. - 1975. V.53. - P.1672-1687.
- [4] Braun M., Fried T. Elastic backscattering cross section of proton on Oxygen // Z. Phys. -1983. V.A311. - P.173-175.
- [5] Amirikas R., Jamieson D.N. and Dooley S.P. Measurement of (p, p) elastic cross sections for C, O and Si in the energy range 1.0-3.5 MeV // Nucl. Instr. Meth. in Phys. Res. - 1993. V.B77. - P.110-116.
- [6] Tilley D.R., Weller H.R., Cheves C.M. // Nucl. Phys. - 1993. V.A564. - P.1-183.
- [7] Salisbury S.R. and Richards H.T.  $^{17}\text{F}$  Level Parameters // Phys. Rev. - 1962. V.126. - P.2147-2158.
- [8] Blue R.A. and Haeberli W. Polarization of Protons Elastically Scattered by Oxygen // Phys. Rev. - 1965. V.137. №2B. - P.B284-B293.
- [9] Trachslin W. and Brown L. Polarization and phase shifts in  $^{12}\text{C}(p, p)^{12}\text{C}$  and  $^{16}\text{O}(p, p)^{16}\text{O}$  from 1.5 and 3 MeV // Nucl. Phys. - 1967. V.A101. - P.273-287.
- [10] [http://physics.nist.gov/cgi-bin/cuu/Value?mud|search\\_for=atomnuc!](http://physics.nist.gov/cgi-bin/cuu/Value?mud|search_for=atomnuc!)
- [11] <http://cdfe.sinp.msu.ru/cgi-bin/muh/radchartnucl.cgi?zmin=0&zmax=14&tdata=123456>.
- [12] Дубовиченко С.Б. Термоядерные процессы Вселенной. Изд. 2-е. Серия «Казахстанские космические исследования. Т.7». Алматы: А-три, 2011. - 402 с.; <http://xxx.lanl.gov/abs/1012.0877>.
- [13] Dubovichenko S.B. Thermonuclear Processes of the Universe. – New-York: NOVA Sci. Publ. (USA), 2012. – 194 p.; [https://www.novapublishers.com/catalog/product\\_info.php?products\\_id=31125](https://www.novapublishers.com/catalog/product_info.php?products_id=31125).
- [14] Dubovichenko S.B. Primordial nucleosynthesis of the Universe. Fourth Edit., revised and expanded. Germany. Saarbrucken: Lambert AcaD. Publ. GmbH&Co. KG, 2014. – 668 p.

## REFERENCES

- [1] Ramos A.R. et al. Measurement of (p,p) elastic differential cross-sections for carbon, nitrogen, oxygen, aluminium and silicon in the 500–2500 keV range at 140° and 178° laboratory scattering angles. Nucl. Instr. Meth. in Phys. Res., 2002. V.B190. P.95-99.
- [2] Gomes V., Douglas R.A., Polga T. and Sala O. The  $E_p = 2.66$  MeV resonance in  $^{16}\text{O}(p, p)^{16}\text{O}$ . Nucl. Phys., 1965. V.A68. P.417-425.
- [3] Chow H.C., Griffithsa G.M., Hall T.H. The  $^{16}\text{O}(p, \gamma)^{17}\text{F}$  Direct Capture Cross Section with an Extrapolation to Astrophysical Energies. Can. J. Phys., 1975. V.53. P.1672-1687.
- [4] Braun M., Fried T. Elastic backscattering cross section of proton on Oxygen. Z. Phys., 1983. V.A311. P.173-175.
- [5] Amirikas R., Jamieson D.N. and Dooley S.P. Measurement of (p, p) elastic cross sections for C, O and Si in the energy range 1.0-3.5 MeV. Nucl. Instr. Meth. in Phys. Res., 1993. V.B77. P.110-116.
- [6] Tilley D.R., Weller H.R., Cheves C.M. Nucl. Phys., 1993. V.A564. P.1-183.
- [7] Salisbury S.R. and Richards H.T.  $^{17}\text{F}$  Level Parameters. Phys. Rev., 1962. V.126. P.2147-2158.
- [8] Blue R.A. and Haeberli W. Polarization of Protons Elastically Scattered by Oxygen. Phys. Rev., 1965. V.137. №2B. P.B284-B293.
- [9] Trachslin W. and Brown L. Polarization and phase shifts in  $^{12}\text{C}(p, p)^{12}\text{C}$  and  $^{16}\text{O}(p, p)^{16}\text{O}$  from 1.5 and 3 MeV. Nucl. Phys., 1967. V.A101. P.273-287.
- [10] [http://physics.nist.gov/cgi-bin/cuu/Value?mud|search\\_for=atomnuc!](http://physics.nist.gov/cgi-bin/cuu/Value?mud|search_for=atomnuc!)
- [11] <http://cdfe.sinp.msu.ru/cgi-bin/muh/radchartnucl.cgi?zmin=0&zmax=14&tdata=123456>.
- [12] Dubovichenko S.B. Thermonuclear processes of the Universe. Second edition, revised and updated. Series “Kazakhstan space research” V.7. Almaty: A-tri, 2011. P. 402.; arXiv:1012.0877 [nucl-th]. (in Russian).
- [13] Dubovichenko S.B. Thermonuclear Processes of the Universe. New-York: NOVA Sci. Publ. (USA), 2012. P.194.; [https://www.novapublishers.com/catalog/product\\_info.php?products\\_id=31125](https://www.novapublishers.com/catalog/product_info.php?products_id=31125).
- [14] Dubovichenko S.B. Primordial nucleosynthesis of the Universe. Fourth Edit., revised and expanded. Germany. Saarbrucken: Lambert AcaD. Publ. GmbH&Co. KG, 2014. P. 668.

## ПРОТОНДАРДЫҢ $^{16}\text{O}$ -ГЕ СЕРПІМДІ ШАШЫРАУЫН ФАЗАЛЫҚ ТАЛДАУ. III

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**Тірек сөздер:** ядролық физика, серпімді шашырау,  $p^{16}\text{O}$  жүйесі.  
**Аннотация.** 110°-178° бұрыштары аймағындағы серпімді  $p^{16}\text{O}$ -шашырауды қозу функцияларындағы дифференциалдық құмаларды белгілі эксперименттік өлшеулердің негізінде 0.4 МэВ бастап 2.5 МэВ дейінгі энергияларда стандарттық фазалық талдау жасалды.

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