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Observation of the X-ray Cherenkov Effect Near 100 eV Photons Energy

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Recently [1] we have reported about the observation of the Cherenkov effect on the L-edge of the absorption of the aluminium. In the present report new results are provided in experimental study of the X-ray Cherenkov effect with photons energy about hundred eV. Using an electron beam with energy of 5.7 MeV, we observed the Cherenkov effect on Si and Be target with a photon energy of about 99.8 eV and 111 eV, respectively. The experimental result on the observation of the Cherenkov effect with Si on the jump of the susceptibility of the L-edge agrees well with an earlier observation of this phenomenon in [2, 3]. The result with Be foil was observed for the first time. In this case the Cherenkov effect was observed at about 111 eV of the photon energy, which corresponds to K-edge absorption of the radiation in the Be. All measurements were carried out using the electron beam of Tomsk microtron [4]. The intensity of the angular distributions of the radiation was investigated using a multilayer mirror {Mo / B4C}100 with a period d = 7.65 nm. In this report the experimental results are compared with calculation. Also the observation possibility of the Cherenkov effect with other kind materials, for example, S, Ba, La, Ce are discussed.

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References

[1] Uglov S., Vukolov A., Kaplin V., Sukhikh L. and Karataev P., EPL,118 (2017) 34002.
[2] Moran M. J., Chang B., Schneider M. B. and Maruyama X. K., NIM B, 48 (1990) 287.
[3] Knulst W., PhD Thesis, Thechnische Universit, Eindhoven (2004).
[4] Uglov S. R., Kaplin V. V. et al., J. Phys.: Conf. Ser., 517 (2014) 012009.

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