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D.M. Zayachuk, E.I. Slynko, V.E. Slynko, A. Csik

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Oscillations and HugePreferences of PbTe Crystal Surface Sputtering under Secondary Neutral Mass SpectrometryConditions

D.M. Zayachuk[a*], E.I. Slynko[b†], V.E. Slynko[b], and A. Csik[c]

[a]Lviv Polytechnic National University, Lviv, Ukraine

[b]Institute of Material Science NASU, Chernivtsy, Ukraine

[c]Institute for Nuclear Research, Hungarian Academy of Sciences, Debrecen, Hungary

ABSTRACT

Sputtering of PbTe crystals by Ar^+ plasma with ion energies 50-550 eV is investigated. A dependence of sputter yields of the Te and Pb on the sputtering ion energy and sputtering time is measured. New phenomena: aperiodical oscillations of Pb and Te sputtering; a huge preference of Te sputtering reaching more than two orders of magnitude at the beginning of sputtering process; and a significant excess of Te integrated sputter yield over that of Pb for prolonged sputtering by low energy plasma at 50-160 eV, are observed. It is substantiated that these phenomena can be caused by the peculiarities of the charge states of the interstitial Pb and Te in PbTe crystal matrix and the processes of re-deposition of sputtered atoms on the sputtered surface.

Keywords: SNMS, PbTe, Sputtering process, Sputter yield, Preferential sputtering

*Corresponding author. tel.: +38 032 258 21 13; fax: +38 032 258 26 80

e-mail: zayachuk@polynet.lviv.ua

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