

Abstract Submitted
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Pressure dependence of Ar_2^+ , ArTi^+ , and Ti_2^+ dimer formation in a magnetron sputtering discharge.¹ MARTIN CADA, Institute of Physics, Academy of Science of the Czech Republic, Na Slovance 2, 18221 Prague 8, Czech Republic, RAINER HIPPLER, Institut für Physik, Ernst-Moritz-Arndt-Universität Greifswald, Felix-Hausdor-Str. 6, D-17487 Greifswald, Germany, VITEZSLAV STRANAK, University of South Bohemia, Faculty of Science, Branisovska 31, 37005 Ceske Budejovice, Czech Republic, ZDENEK HUBICKA, Institute of Physics, Academy of Science of the Czech Republic, Na Slovance 2, 18221 Prague 8, Czech Republic, CHRISTIANE HELM, Institut für Physik, Ernst-Moritz-Arndt-Universität Greifswald, Felix-Hausdor-Str. 6, D-17487 Greifswald, Germany — Formation of Ar^+ and Ti^+ monomer and of Ar_2^+ , ArTi^+ , and Ti_2^+ dimer ions in a magnetron sputtering discharge with a Ti cathode and in an argon atmosphere was investigated by means of energy-resolved mass spectrometry. Energy spectra of Ar^+ and Ti^+ ions show distinct features which are related to the specific formation processes taking place in the plasma region and during ion bombardment of the Ti cathode. Our observations proved that low-energy Ar^+ ions are produced inside the plasma region. Ti^+ ions originate from sputtering events. The measured energy distribution of titanium ions does not follow Thompson's formula, however. At the lowest gas pressure the measured energy distribution can be modelled by a shifted Maxwellian distribution. Formation of Ar_2^+ , ArTi^+ , and Ti_2^+ dimer ions show pronounced pressure dependencies which are attributed to various formation and loss processes.

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