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Deposition of a-C:H films by atmospheric pressure plasma jet in acetyleneThorben Kewitz¹, Joachim Oesert², Stanislav N. Gorb², Holger Kersten¹¹Kiel University, Kiel, Germany ²Zoological Institute, Kiel University, Kiel, Germany

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Thin film coatings obtained by plasma processes are widely used to modify surface and material properties. Applications include for example protection layers, optical layers and the modification of the surface energy. Different materials have been proven to be useful for various applications, e.g. SiO_x films are often used for protection layers due to their scratch resistance. Hydrogenated amorphous carbon (a-C:H) coatings have some advantages due to their interesting properties depending on the process parameters, for example a large range of the refractive index or low friction. They are already used in low pressure [1, 2] and atmospheric pressure plasma processes [3, 4]. This work focuses on the particle formation due to the admixture of acetylene to a commercially available atmospheric pressure plasma jet [5]. If the jet is located at a substrate in close proximity, the particles were found to form a coating, in which the individual particles with a size of a few tens of nm can still be distinguished. We analyzed these coatings for different discharge parameters and present the results.

[1] O. Polonskyi et al., Thin Solid Films 540 (2013) 65-68

[2] E. Tomasella et al., Surface and Coatings Techn. 141 (2001) 286-296

[3] R. Thyen et al., Surface and Coatings Techn. 97 (1997) 426-434

[4] S.P. Bugaev et al., Surface and Coatings Techn. 96 (1997) 123-128

[5] <http://www.plasmatreat.de/>**Keywords**

atmospheric pressure plasma

a-C:H films