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The comparison of metal coating growth on nanofibers with metal film growth on flat surfaces ALPER BULDUM, Department of Physics, The University of Akron, Akron, OH, 44325 — Recent experiments showed that physical vapor deposition is a powerful technique to form novel one-dimensional nanostructures such as metal coated nanofibers and metallic hollow nanowires. In order to have a better understanding of metal coating growth on nanofibers and to determine its differences with metal film growth on flat surfaces, molecular dynamics simulations are performed. Adsorption, reflection and etching events are analyzed and corresponding reaction probabilities are calculated for both flat and cylindrical coating surfaces with different radii. Our investigations showed that reaction probabilities for metal coating growth on nanofibers are very different from the reaction probabilities for metal film growth for higher kinetic energies or for large off-normal angles of incidence of Al atoms. If one considers only the reaction rates, diffusive transport of Al ions in the plasma of physical vapor deposition is found to be more favorable than ballistic transport of Al ions for the growth of Al coatings on nanofibers. These investigations provide us important insights for the growth of metal coatings on nanofibers and for the formation of hollow nanowires with different surface morphologies.

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