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Diamondoids enables 10nm resolution on X-ray PEEM HITOSHI ISHIWATA, Stanford University, HENDRIK OHLDAG, Stanford Synchrotron Radiation Laboratory, ANDREAS SCHOLL, Lawrence Berkeley National Laboratory, OLAV HELLWIG, Hitachi Global Storage Technologies, PETER SCHREINER, Justus-Liebig Universitaet, Institut fuer Organische Chemie, JEREMY DAHL, NICK MELOSH, Z.X. SHEN, Stanford University — Diamondoids are the smallest sp3 bonded carbon cage that can be found in different sizes and shapes, starting from single cage called adamantine that contain 10 carbons all hydrogen terminated on outside. While the electronic structure and material properties of diamondoids are based on bulk diamond, their nanostructure allows for tailoring their properties to a particular task. Diamondoids can be produced reliably and cost effective in different sizes and quantities. They exhibit a tremendous potential for real-world applications, e.g. as seed crystals in diamond growth, as robust mechanical coatings or as highly efficient electron cathodes. Here, we will focus on the latter, showing how diamondoid coating can be used to push the spatial resolution to the limit and significantly increasing the efficiency of an x-ray based cathode lens microscope (X-ray Photoemission Electron Microscope or XPEEM) by minimizing the effect of chromatic aberrations caused by the energy spread of the electrons emitted from the cathode. The unique feature of XPEEM microscopy is that it is capable of acquiring images with magnetic, chemical, structural as well as topographical contrast of surfaces and shallow interfaces. The

capability to obtain such images with 10nm spatial resolution through shi Ishiwata Prefer imal Selevin cost and readily available nanodiamond coating converses and readily av

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