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**Study on Pure Phase Formation of Lead Oxide Nanowires by Oxidation of Lead Nanowires** KUO HAI, XIAOGANG WANG, Hunan Normal University, DEPARTMENT OF PHYS., HUNAN NORMAL UNIVERSITY TEAM — Lead-oxide nanowires were synthesized by oxidizing lead metal nanowires. The phase structures, sizes and morphologies of the nanowires were investigated by atomic force microscopy and x-ray diffraction, and the band gap of the nanowires was determined by UV-Vis-NIR reflectance diffusion spectrums. The thermodynamic environment for the pure phase formation has been studied. The first-principle computation has been done to help understand the phase formation. Our results reveal that the pure phase formation strongly relies on both the process temperature and the oxygen flow/oxygen partial pressure, and the pure phase  $\beta$ -PbO nanowires can be obtained only in a narrow, low temperature range under a low oxygen flow.

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