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Nano-confined water on surfaces of metal oxide nanoparticles ANDREY LEVCHENKO, JULIANA BOERIO-GOATES, BRIAN WOODFIELD, ALEXANDER KOLESNIKOV, NANCY ROSS, DAVID WESOLOWSKI, DAVID COLE, ALEXANDRA NAVROTSKY, PETER A ROCK THERMOCHEMISTRY LABORATORY AND NEAT ORU, UNIVERSITY OF CALIFORNIA - DAVIS TEAM, DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY, BRIGHAM YOUNG UNIVERSITY COLLABORATION, INTENSE PULSED NEUTRON SOURCE, ARGONNE NATIONAL LABORATORY COLLABORATION, CRYS-TALLOGRAPHY LABORATORY, DEPARTMENT OF GEOSCIENCES, VIR-GINIA TECH COLLABORATION, CHEMICAL SCIENCES DIVISION, OAK RIDGE NATIONAL LABORATORY COLLABORATION — Nanolayers of water interacting with metal oxide surfaces demonstrate physical properties that are significantly different from those of bulk water and ice. Our recent water adsorption experiments suggest that the entropy of surface water is lower than those of bulk water and ice implying restricted motion of the water on the surface. We have studied dynamics of water on nanoparticles of two oxides, TiO_2 and SnO_2 by inelastic neutron scattering. Vibrational density of states for surface phonons of water confined by oxide surfaces has been calculated. Heat capacity of confined water has been measured by adiabatic calorimetry and compared with values derived from the vibrational density of states.

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