Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Adhesion in Nanodiamond Particles VASUDEVA RAO ARAVIND, LUKE LUTKUS, BENJAMIN LEGUM, Clarion University, CLARION UNIVERSITY COLLABORATION — Due to their excellent mechanical properties and biologically non-toxic nature, nanodiamonds show great promise for applications in tribology, lubrication, drug delivery, tissue scaffolds and surgical implants. In order to design effective nanocomposites and other biomedical systems exploiting these properties, it is important to understand the properties and mechanisms by which nanodiamonds adhere to other materials, and how they behave at interfaces. In this article, the adhesive force between nanodiamond particles and the silicon scanning probe microscope tip are reported. The adhesive force can be correlated to the purity and functionalization of nanodiamond surface, and the values range from 0.1nN to 2.0nN for the samples studied. It is observed that the lateral forces applied by the scanning probe tip can cause the adhesive forces to increase by an order of magnitude from 0.1 to 2.0nN at regions where the tip experiences maximum contact force.

Vasudeva Rao Aravind
Clarion University

Date submitted: 26 Nov 2012 Electronic form version 1.4