Abstract Submitted
for the DFD11 Meeting of
The American Physical Society

Vibration Assisted Convective Deposition TANYAKORN MUANGNAPOH, ALEXANDER WELDON, PISIST KUMNORKAEW, JAMES GILCHRIST, Center for Advanced Materials and Nanotechnology, Department of Chemical Engineering, Lehigh University, Bethlehem, Pennsylvania 18015 — A novel strategy for improving a convective deposition of aqueous binary suspensions of colloidal microspheres and nanoparticles was experimentally examined and reported. By adding a substrate vibration, an enhancement in deposited film qualities was observed. Moreover, by using this technique, it was easier and faster to obtain monolayer structures. In this experiment, we varied the amplitudes of substrate vibration between 0-330 μm. The quality of thin films was characterized by using a confocal laser scanning microscope and an image analysis. The motion of an interfacial liquid surface and the change in an evaporate rate due to a substrate vibration played an important role in an improvement of the deposition process. The monolayer structures formed from this rapid process can be used in a variety of optical, chemical, and biochemical sensing applications such as a LEDs device, a membrane separation and a cell capturing.

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Date submitted: 27 Jul 2011 Electronic form version 1.4