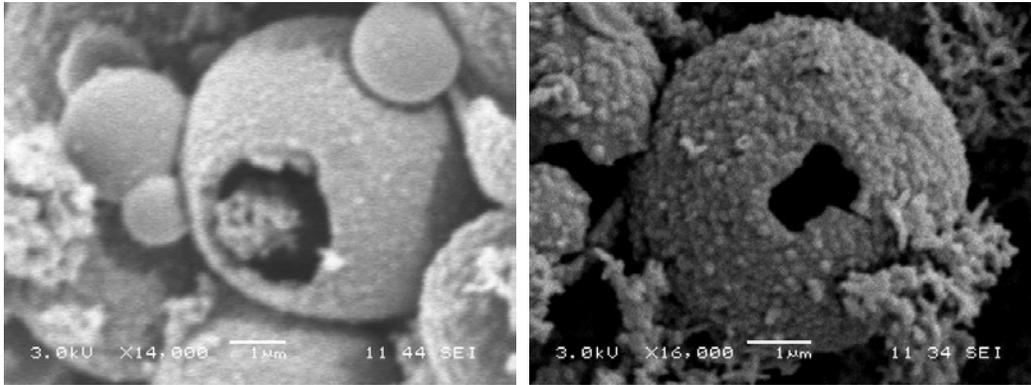


Hollow microspheres of doped polyaniline via a template free synthesis

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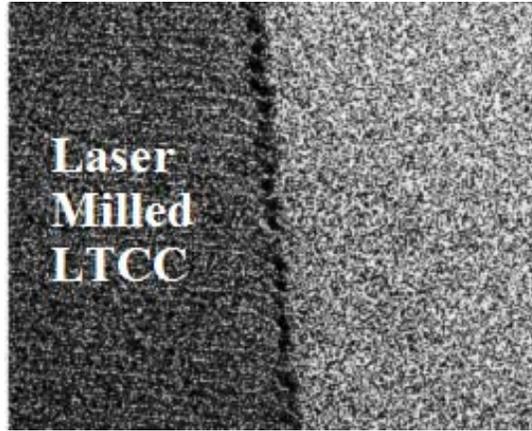


The Figure above is a Scanning Electron Microscope (SEM) image of doped polyaniline microspheres synthesized via a template-free method. The above sample was prepared at PENN during the summer of 2004 and the SEM image was taken at UPR-Humacao. In the synthesis, the aniline monomer was added to salicylic acid and dissolved in water. This results in the formation of micelles that act as templates[1] so that when an aqueous solution of the oxidant was added to the above solution, the polymerization (which was done at 0 °C) proceeded on the surface of the micelle to produce the hollow microspheres by accretion as seen in the Figure above.

[1]L. Zhang and M. Wan, *Adv. Funct. Mater.* **13**, 815-820 (2003).

Silicon Depletion Observed with EDS in Sintered LTCC after Laser Milling

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We are developing microfluidic oscillators for flow control and measurement and fluid identification. This type of device has one supply input (S) and two outputs. Part of the output flow (gas or liquid) is injected to control inputs using feedback channels what causes the oscillation of the main flow inside the device. These devices are being fabricated by stamping of LTCC using micromolds, Laser milling of LTCC and quartz substrates, and lithography of thick photoresist (SU-8). The image displayed above was obtained as part of an undergraduate researcher developed at UPENN during the summer of 2004.