Observing Nanomaterials Embedded in Polyethylene Terephthalate Fiber

Polyethylene terephthalate (PET) is a thermoplastic polymer resin used to manufacture synthetic fibers. Raw PET fibers are used to strengthen food packaging, pressure sensitive adhesive tapes and thermal insulation. Researchers and scientists are using an array of nanomaterials to increase the strength and flexibility of PET products. The addition of nanomaterials allows the use of PET fibers to advance tissue engineering, drug delivery and flexible electronics. The CytoViva Hyperspectral Microscope system can spectrally detect and quantify multiple materials embedded in a PET fiber.

Figure 1: Polyester fiber with 100nm coated Au NP and 605 nm Q-Dots

Figure 1 is a hyperspectral image of a PET fiber taken with the CytoViva Hyperspectral Microscope system. This fiber has been embedded with 100nm coated gold nanoparticles (AuNP) and quantum dots (Q-dots) that excite at 605nm. Figure 2 is a spectra taken from the green box in Figure 1 that is representative of the coated AuNPs in the fiber. Figure 3 is a spectra taken from the red box in Figure 1 that is representative of the Q-dots in the fiber. Figure 4 is a spectra taken from the white box in Figure 1 that is representative of the fiber itself.

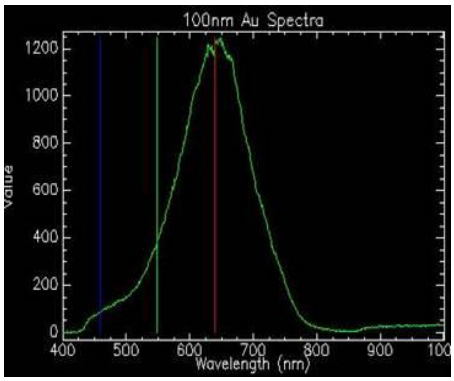

Figure 2: 100nm coated Au NP spectra

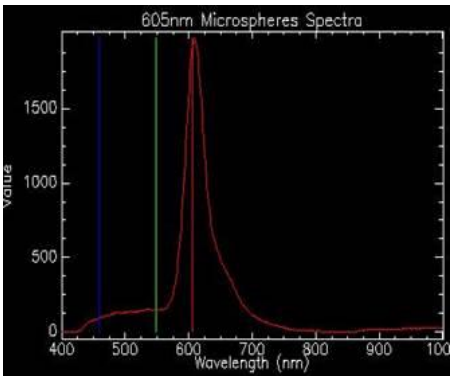

Figure 3: 605nm Q-dot spectra

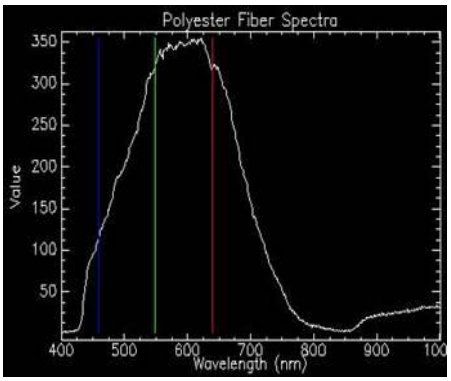

Figure 4: PET polymer spectra

The CytoViva Hyperspectral Microscope system then uses these spectral signatures to detect and quantify the nanomaterials embedded in the fiber.

CytoViva, Inc • 570 Devall Drive • Suite 301 • Auburn, AL • 36832
info@cytoviva.com • 888-737-3130 • www.cytoviva.com