initial indentation was performed here at WSU using the Vickers hardness tester, but defects in the material surface. Also at small loads the depth of indentation was small and the resulting microstructures and mechanical properties were investigated to determine if improvements to the alloy were made.

SEM

The Scanning Electron Microscope (SEM) was used to determine the elemental composition of the Ti-6Al-4V unimplanted and gold implanted samples. Three types of scans were performed using a program called EDAX, they include point line and area scans. Point scans tell you the composition at a point. Each peak indicated the presence of a particular element. The point scans below were done at 3,000X magnification and indicate the presence of Titanium, Aluminum, and Vanadium. There is no indication of gold.

Intelligence VS Depth

Line scans tell you composition as a function of a position along a line on the specimen. The line scans below show that the intensity of Titanium is a relative constant function of Depth.

Elastic Modulous VS Depth

Area scans tell you the composition of an area. From the area scans below which were done at 10,000X magnification, you can see very small speckles of gold Au in red.

XRD

X-ray diffraction (XRD) was used as a bulk compositional analysis tool. It was hoped that a broad background peak would be present to show an amorphous layer or a peak could identify gold in the material. Unfortunately x-rays typically travel between 10 to 100 microns, which means our gold implanted layer of 0.12-0.23 microns was not identified by any diffraction peaks. Grazing angle x-ray diffraction was used in similar research with success; unfortunately there are no such facilities on campus. Peaks for titanium, aluminum and vanadium were given, however.

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