

**Titania (TiO<sub>2</sub>)** is a material that, in the form of thin films, offers multiple application in areas from human health to decoration. The high density (see SEM picture in the inset) of the thin films made by the PPD accompanied by the exceptional surface flatness makes the method superior to others for the deposition of structural color for the decoration of jewelers. Bright yellow, red, blue, green and turquoise are obtained depending on the thickness of the thin films. The direct ablation process of TiO<sub>2</sub> by the PPD renders obsolete the traditional two stages process (sputtering

plus galvanic oxidation) giving rise to superior colors by way of a simpler method. In addition TiO<sub>2</sub> films are anti-allergic and biocompatible. In fact the approval by the Food and Drug Administration (FDA) makes it a material of choice for application in coatings of metal in contact with the human skin as well in human implants. Example of decoration on stainless steel is shown in Fig.1. The coating is very compact and highly adhesive. The plasma plume spectrum of the PPD ablation is show in Fig.2.

Typical characteristics of titania thin film are:

- **Highly adhesive and compact film on stainless steel and temperature sensitive substrates (plastics)**
- **Biocompatible (FDA approved) coatings for human implants**
- **Bright structural colors ever made by physical vapor deposition**



Fig. 1 Titania on stainless steel

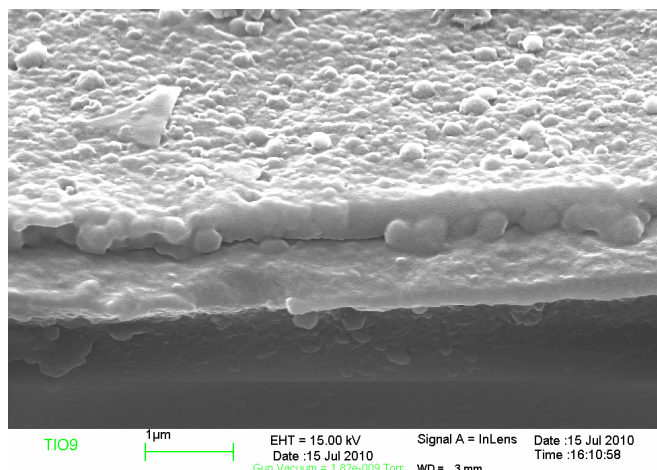


Fig. 2 SEM cross section of TiO<sub>2</sub> on ....