# Structure and Properties of Titanium Doped Tungsten Bisulfide Thin Films Produced by Magnetron Co-Sputtering DC Technique

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**Abstract**
In this work were deposited Titanium doped tungsten bisulfide films (WS2-Ti) on AISI 304 stainless steel substrates using Magnetron Co-Sputtering DC technique, varying titanium power cathode from 0 to 25W. Using Energy dispersive Spectroscopy (EDS) were determinate the titanium content on the WS2 structure, obtaining a maximum of 10%. X- Ray Diffraction (XRD) results showed for the pure sample the presence a hexagonal phase on high intensity on (100) plane. However with titanium insertion, it promoted a nanocomposite formation [1] this is verified with TEM images. Raman spectroscopy shows the formation of tungsten and titanium oxides of film surface. The tribological behavior was measured using Ball on Disk (POD) Test obtaining Friction Coefficients- Cycles curves, were it observed a friction values of 0.1 for the pure sample and 0.15 for 5W sample.

**Key words:** Thin Films, Doping, Solid Lubricant, co-Sputtering

Figure 1. EDS of WS2 with different content of Titanium

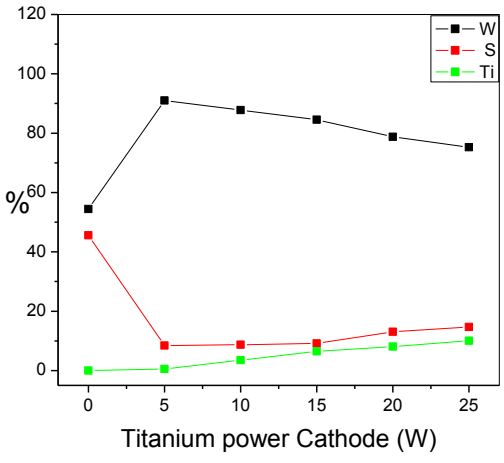



Figure 2. Diffraction pattern of the WS2 andWS2 -Ti layers grown by magnetron sputtering DC

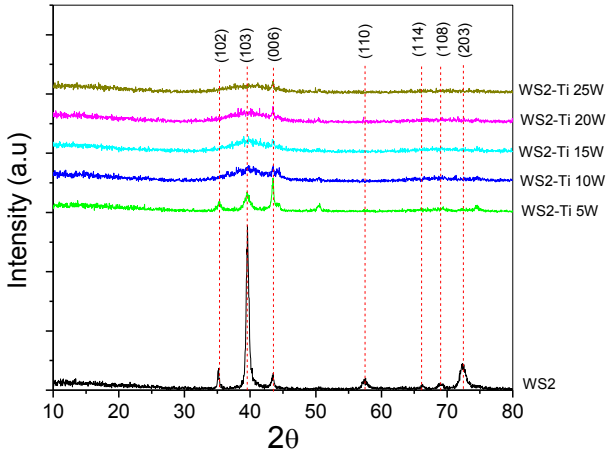
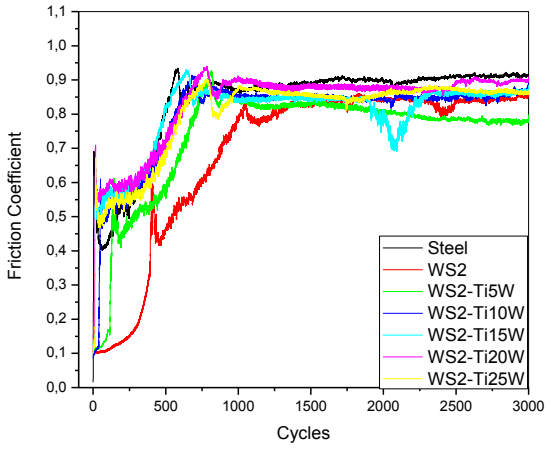



Figure 3. Coefficient of friction as a function of cycles by using the Ball on Disk test for the substrate and WS2 and WS2-Ti films




**References**
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