

PO3034

**Decorative Zirconium oxynitride coatings deposited by magnetron sputtering: an attempt to break the chemical and color restrictions**

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Zirconium oxynitride coatings are an interesting choice for aesthetic purposes, due to the combination of chemical stability, biocompatibility, good mechanical properties and a nice palette of colors achievable. Moreover, its preparation by reactive magnetron sputtering is relatively easy and simple. However, there are some particular colors, such as light blue or green, which are very difficult to achieve. Additionally, the chemical composition of samples lays in a very particular region of the Zr-O-N ternary diagram, which is probably one of the main reasons behind the limitations observed for the observed colors.

In this contribution, we will make a complete study of the Zr-O-N system, including an exhaustive comparison with literature. First, the deposition parameter space is explored, by changing target power, bias and composition of the sputtering atmosphere. The chemical and phase composition and structure of the films are evaluated by RBS, XRD and SEM, respectively, and correlated with the synthesis conditions. Finally, the color of the coatings is measured by spectrophotometry and interpreted in terms of the characteristics of the films.

**Keywords**

color  
decorative  
aesthetic  
RBS  
XRD