

21、 Tribocorrosion

Surface chemical reactions explored for improving the tribological performance of sputtered coatings

A. Cavaleiro^{1,2}

¹ CEMMPRE, ARISE, Mechanical Engineering Department, University of Coimbra, 3030-788 Coimbra, Portugal.

² IPN – LED&MAT – Instituto Pedro Nunes, Laboratório de Ensaios, Desgaste e Materiais, Rua Pedro Nunes, 3030-199 Coimbra, Portugal.

albano.cavaleiroelho@dem.uc.pt

Abstract In this presentation, the synergetic effect of tribo-contact and chemical reaction will be explored in order to improve the tribological performance of sputtered coatings, providing them with a self-lubrication ability besides the high wear resistance. The application of this concept in particular to sputtered coatings is related with the versatility of this technique to produce materials with any type of chemical composition, different structural phases and their arrangement as well as different architectures. Therefore, in the talk, several examples of the modification of the chemical composition of different transition metal nitrides (Ti, Al, Mo, W), usually developed as hard coatings, by the incorporation of different elements (e.g. Cr, V, Ag,...) will be presented. Moreover, the necessary changes in the coatings structure and architecture will be discussed, such as, nanocomposites and multilayers..

Keywords Self adaption; Tribofilms; Lubricant oxides; Self-lubrication; Solid lubrication; Low friction.