NAPLES, ITALY 30 JUNE - 4 JULY
ACEX2025 NAPLES
18th International Conference on Advanced Computational Engineering and Experimenting

ABSTRACT

Synthesis, Microstructure and Deformation behavior of Hard and Damage-Tolerant High Entropy Nitride Coatings

Wear and corrosion resistance are two outstanding properties for which coatings are commonly designed. This is often done at the expense of the damage tolerance of the materials used. The concept of high-entropy alloys is characterized by the fact that it allows for new combinations of properties to be expected that do not appear to be achievable with conventional material classes. The present study takes up on this potential and presents it based on coatings made of high-entropy nitrides, which are produced by using refractory elements as well as Al or Si. The emphasis of the study is on a comparison of different experimental strategies for evaluating the damage tolerance of these coatings. The results show that coatings made of high-entropy nitrides exhibit high hardness combined with good toughness. However, a uniform tendency of the property combinations across all applied measurement methods could not be determined.