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Spectral Properties and Thermal Stability of Mo/ZrSiN/ZrSiON/SiO2 Solar Selective Absorbing Coating

Cong Wang[1], Yuping Ning[1], Eric Tomasella[2], Lei Wang[3], Angélique Bousquet[2], Binghui Sun[1]

[1]Beihang University, Beijing, China [2]Université Clermont Auvergne, CNRS, Clermont-Ferrand, France [3]University of Sci and Techn. Beijing, Beijing, China

congwang@buaa.edu.cn

Abstract:
The Mo/ZrSiN/ZrSiON/SiO_2 solar selective absorbing coating, which can be used for photo-thermal conversion in solar absorber, is fabricated on stainless steel (SS) substrate by magnetron sputtering. The deposition parameters, composition and layer thickness are optimized experimentally. High solar absorptance of 0.95 and low thermal emittance of 0.06 are obtained in the coating. On the other hand, it also exhibits an excellent thermal stability up to 600 °C both in vacuum and air. The evolution of the structure, surface morphology and optical properties of the coating with temperature are carried out using XRD, AFM, spectroscopy, etc. The elemental diffusion at the interface of the multilayer films after aging at 700 °C for 100 h is analyzed by Rutherford backscattering spectroscopy (RBS). The results show that this coating can be a good candidate for concentrated solar power (CSP) project in high temperature

Keywords
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