

The increasing industry demands give rise to a continuous call for materials with an improved combination of mechanical and oxidation properties. Recently developed Complex concentrated alloys – alloys consisting of multiple elements in near-equiatomic ratios – may fulfill these criteria. One of the promising group of these alloys comprises base FeAlCr and other alloying elements such as vanadium, nickel or cobalt. In this study, we focused on the detailed characterization of the microstructure and high-temperature oxidation of FeAlCr-Ni-V alloys with various content of nickel and vanadium. We have found out that investigated alloys FeAlCrNiV and FeAlCrNi exhibit promising BCC/B2 microstructure, possibly providing a preferable combination of ductility and strength. However, our findings have shown that vanadium, even in a reduced amount, deteriorates oxidation resistance of the materials and leads to the formation of complex multilayered oxide scale. Presumably, the formation of V_2O_5 impairs alumina and chromia scale and limits the formation of more protective scales. Generally, this study also reveals limitations in the characterization of complex oxide scales and presents the complexity of the oxidation process of Complex concentrated alloys.