The thesis is focused on the oxidation characteristics of two complex concentrated alloys – FeAlCrMo and FeAlCrV. Potentiodynamic polarisation tests were performed in order to characterize corrosion behavior of the alloys in two different corrosion media (aqueous solution of 3,5% NaCl and 0,5M H_2SO_4), in addition, high-temperature oxidation resistance was studied. All tests were performed also for stainless steel used as a benchmark. An excellent corrosion resistance of both alloys was discovered, especially in the acidic solution, the studied alloys even surpassed reference stainless steel. On the contrary, poor resistance to high-temperature oxidation was observed. Particularly FeAlCrV exhibited catastrophic properties and resistance of FeAlCrMo is also inferior to stainless steel.