Purpose of this thesis is a study of substrate temperature influence on structure, chemical composition and morphology of tungsten oxide thin films prepared by oxidation of a tungsten single crystal W(110) using a radio frequency plasma source. Thin film´s parameters were observed by RHEED, XPS, AFM snad SEM. The substrate was oxidized at room temperature (RT) and at temperatures of 400° C, 500° C and 550° C. In the first and the second case, produced thin films were amorphous and epitaxial structure was obtained by recrystallization. At the temperature of 500° C, an epitaxial thin film was produced directly. After further heating at the temperature of 550° C we got polycrystalline thin film without orientation of the crystal grains. All the epitaxial thin films had (111) crystallographic plane parallel to substrate surface. The tungsten oxide layers grew with relatively hight surface roughness in the order of several nanometers.