The main aims of research project are investigation of possibility of novel approach to electroplating of tungsten-copper alloys with following detailed analysis of their internal structure. The results which I obtained so far proven, beyond doubt, possibility of simultaneous codeposition of tungsten and copper from aqueous solutions. Both components of the alloy were metallic, what leads to material with crack-free surface and interesting internal structure. The structure of material is composed of fine-grained crystallites of nanometer size, what significantly influence on both corrosion and mechanical resistance. The use of different current regimes of galvanic deposition of Cu-W alloys should lead to obtainment of even more interesting materials, enhance the phenomenon of induced codeposition of tungsten with copper and to overcome the limitations of the process encountered so far.

The electroplating (galvanic) methods are techniques of electrodeposition from aqueous solutions pure or multi-component materials. Despite those methods are been used over decades they are still significant in contemporary material-engineering. The basis of those methods is applied current-flow through the solution, which under suitable conditions causes deposition of the product on the electrode known as the cathode. The second electrode – anode can be a source of electrons or both electrons and ions for the galvanic bath. The deposits composed of more than one metal are called electrodeposited alloys. The most common approach in electroplating techniques is control of the process by current flow – the flow of electric charge remains constant during experiment. Other, not so often used technique is where the potential difference between electrodes remains constant during whole process. An alternative for both mentioned above, typically used approaches is pulse electroplating, what can be explained as alternating of the potential or current between two different values resulting in a series of pulses. Those pulses can significantly influence deposit-alloy composition, its internal structure and morphology. There are many possible options in modifications of pulse methods and combinations what will be a highly important in this research project.

Tungsten alloys with copper obtained with other methods found various applications although considerable complexity and high cost of their production. Therefore, it is appropriate to examine new, efficient, low cost and ecological ways of their obtaining. Without doubt the electroplating possess mentioned all advantages. Moreover, this research project will make a significant contribution to the understanding of the phenomenon of induced codeposition of tungsten. Mechanism of this process although have been examined and discussed over decades still has not been established.