**Poster presentation**

**Electrochemical reduction of perrhenate ions in the electrolytes of different composition**

1Kalyyeva A., 2Kudreeva L., 3Zhumasheva N.

*1PhD,al-Farabi Kazakh National University*

*71 al-Farabi Ave., 050040, Almaty, Kazakhstan*

*2candidate of Sciences, al-Farabi Kazakh National University*

*71 al-Farabi Ave., 050040, Almaty, Kazakhstan*

*3Master student, al-Farabi Kazakh National University*

*71 al-Farabi Ave., 050040, Almaty, Kazakhstan*

*nazeka\_0905@mail.ru*

In recent years, interest in the production of rhenium compounds has been observed because of unique properties for the development of high technological devices. The combination of unique physicochemical properties of rhenium makes this metal promising for use in high-tech industries, solid oxide fuel cells, electrochromic devices, solid-state batteries and others, for example in these fields: aviation, rocket engines, nuclear power engineering, electronics, biomedicine and heterogeneous catalysis. Most rhenium based coatings are applied using chemical or physical gas phase condensation (known as CVD and PVD methods).In these processes, metal coatings are produced by expensive devices in a vacuum. Deposition of rhenium using electrolysis method is advantageous economically and energetically.

Deposition of perrhenate ions from aqueous electrolytes has its drawbacks. It goes with high hydrogen overvoltage.It decreases the efficiency of rhenium reduction. The data about electro deposition of perrhenate ions from non-aqueous electrolytes was not investigated enough. To optimize the deposition process of perrhenate ions in electrolysis method is important.Thus, the goal of this investigation is to determine optimal electrolyte composition.

In this study the recovery and oxidation processes of rhenium in organic medium such DMF and DMSO have been investigated. The deposition of rheniumin presence of citrate acid in the KNO3, NaNO3, H3BO3, Na2SO4 and (NH4)2SO4 electrolytes on graphite electrode have beenstudied.The morphology and content of obtaineddeposited film from following electrolytes have been compared. The recovery and oxidation potentials of rhenium in these electrolytes were determined using cyclic voltammetry. The content of deposited film on electrode was identified using X-ray and SEM method.