

**Synthesis, crystal structure and physico-chemical properties
of the perovskite related oxides
belonging to the Sr–Nb–Ni–O and Sr–Ni–Fe–Nb–O systems**

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The complex perovskite related oxides, regarding the Sr–Nb–Ni–O and Sr–Ni–Fe–Nb–O systems were successfully synthesized. It was shown that the phase crystal structure of the layered oxides obtained consists of two perovskite layers alternating with a rock-salt block (similar to the so-called Ruddlesden–Popper phase – $\text{Sr}_3\text{Fe}_2\text{O}_7$). The oxides can be considered as solid solution with $\text{Sr}_3\text{Ni}_{0.8}\text{Fe}_{0.2}\text{NbO}_{7-\delta}$, and $\text{Sr}_3\text{Sr}_{0.2}\text{Nb}_{0.9-x}\text{Ni}_{0.9+x}\text{O}_{7-\delta}$ ($0 \leq x \leq 0.4$) compositions. It was determined that the phases show n-type of conductivity within the 20–500–700 °C temperature range. Transformation to metal-like characteristics of conductivity can be observed at higher temperatures. The variation of the oxygen concentration in $\text{Sr}_3\text{Ni}_{0.8}\text{Fe}_{0.2}\text{NbO}_7$ and $\text{Sr}_3\text{Sr}_{0.2}\text{Nb}_{0.9}\text{Ni}_{0.9}\text{O}_7$ compounds with temperature (up to 1000 °C) and equilibrium oxygen partial pressure ($p_{\text{O}_2} = 49 \text{ Pa}$) is close to the value of 1 %. It has to be assumed that the oxides present high stability.