

## Recycling electrochemical processing of Ag(I) species dispersed in polypyrrole towards Ag<sup>0</sup> nanoparticles.

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### Czasopismo

Synthetic Metals

### Numer woluminu

270

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Artykuł

### Streszczenie

Silver(I) hexafluorophosphate was dispersed in electrosynthesized polypyrrole hexafluorophosphate by precipitation, using an aqueous Ag(I) nitrate solution. The electrochemistry of the resulting composite was studied in aqueous hexafluorophosphate. The examined potential window encompassed the reversible redox process of the polymer and the redox transformations of the inorganic components, i.e. silver species, taking place within this window. The electrocrystallization of silver nanoparticles was controlled by dc potential. The Ag nanoparticles entrapped in polypyrrole, generated at reduction potentials of the composite, were 10<sup>1</sup> nm in diameter. The slightly larger AgNP of a mixed chemical nature was formed by a spontaneous discharge of the oxidized polypyrrole - salt composite towards the open circuit potential. Electrochemical processing and characterization of the composite were done using the dc and ac methods. Several other methods of chemical and structural identification were employed. The influence of oxygen for the processing of the composite towards metallic nanoparticles was shown. Electrochemical chemically irreversible oxidation of Ag<sub>2</sub>O to AgO in the polypyrrole matrix was found.

### Słowa kluczowe

synthetic metals, polypyrrole composites, Silver nanoparticles, redox chemistry, electrocrystallization

### Adres publiczny

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### Strona internetowa wydawcy

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