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Metallic nanoparticle dispersions for conducting ink preparation

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Metallic nanoparticle dispersions for conducting ink preparation

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The aim of this research is to prepare conducting nanoparticle inks, such that it would be possible to print electrical components using a functional ink-jet printer.

Relevance of the topic is related to preparation of cheap and wearable electrical circuits, preparation of RFID antennas, preparation of sensors.

Following nanoparticles for inks were prepared: silver spherical nanoparticles in water, silver triangle nanoprisms in water, copper spherical nanoparticles in hexane, copper spherical nanoparticles with silver shell in hexane and nickel spherical nanoparticles in hexane. Prepared dispersions were characterized with SEM or TEM microscopy, UV-Vis spectroscopic methods, XRD, DLS, electrical conductivity was estimated and aggregation stability. In all dispersions nanoparticle size is less than 100 nm. All samples were sintered at 150o, 200o, 250o, 300o C temperatures and after that those samples were analyzed with SEM. It can be concluded, that it is possible to formulate inks using these particles, and it may be possible to use these to print electrical components.

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