Lehrstühle und Professuren

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Titel des Beitrags: Solution processing of silver nanowires for transparent heaters and flexible electronics

Abstract:
We present the solution-based synthesis of silver nanowires (AgNWs) with an aspect ratio over 400 in a short growth time of 20 min. The addition of potassium chloride (KCl) during the growth regulates the supply of silver atoms and leads to an agglomerate-free and well-dispersed solution. Via a facile and scalable deposition technique, i.e. spray-coating, the AgNWs are deposited to transparent electrodes (TEs) on flexible or glass substrates. Without any post-treatment such as sintering that can harm the substrate, the films show a high transparency at a low sheet resistance. The TEs are characterized as transparent heaters in terms of their infrared, transient thermal and electrical properties up to a working temperature of 130 deg. C. For the use in flexible electronics, an AgNW-film on a polyvinyl chloride (PVC) substrate is tested under operation for 10,000 bending cycles and shows only a slight increase in resistance.

Stichworte: AgNW, silver nanowires, transparent heater, flexible electronics, spray-coating

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