

pH-controlled Silver -organo -complex (AOC) Based Inks: Low -temperature (< 120⁰C) Sintering For High Conductive Printed Features

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The basic requirements for metal -based inks are similar to those of standard inkjet inks, but in addition, they should provide good electrical conductivity of the printed pattern. The ink should demonstrate compatibility with the substrate and good printability and resolution with minimum printer maintenance. In addition, the ink should be processable (annealing, curing) at temperatures below 120 °C to be compatible with wide range of flexible substrates. In this regards, we have developed easy synthetic route for innovative Ag-organo complex (AOC) based stable ink with record silver loading by ink -solution pH modulation, which can be sintered at low temperature resulting highly conductive printed features. Inkjet -Printed AOC ink on PET substrate sintered at 100⁰C for 30-minute resulted the resistivity of ~ 11.27 μ .cm which is ~ 7 times higher than bulk silver. The diverse substrate material choice including flexible polymer, paper, glass and ink -filled pen/inkjet -printing approach using cost -effective silver patterning with low resistivity makes our approach for portable fabrication route leading to additional economic benefits.