

# ENERGY AND MATERIALS RESEARCH

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## Xible and transparent porous nickel electrodes in potential flexible applications

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Transparent flexible electronics are highly demanded for modern technology applications such as solar cells, lighting displays, and wearable requirements. Here porous-nickel-film based flexible and transparent electrodes (FTEs) were investigated. The continuous, holey, and lacey nickel films were fabricated on various polyimide substrates using DC sputtering. The electrical resistance and resistance ratio ( $R/R_0$ ) of the prepared nickel electrodes were characterized under various experimental conditions, such as bending, stretching, and twisting. It was found that the electrical resistance increases in either quadratic (second order polynomial) or exponential trend in the three types of electrodes under bending. During stretching, the resistance increases polynomially, exponentially or linearly with strain rate. The same electrical behavior was observed under twisting. Their physical properties were also characterized with X-ray diffraction, scanning electron microscopy, transmission electron microscopy, atomic force microscopy, and vibrating-sample magnetometer. These fabricated nickel films are magnetic and can be used for several FTE applications in the future.

### Biography

Rola Mohammed Derbeshi is a native of Saudi Arabia. Rola is earned B.S. in Physics, University of Jazan, Saudi Arabia, 2010 and M.S. in Physics, Morgan State University, USA, 2017 Fall. She was an active student there. She used to be teaching Assistant at the University of Jazan, College of Arts and Sciences, 2014, Research assistant on theoretical modelling, the University of Jazan, College of Arts and Sciences, 2009 - 2010, Research assistant on flexible electrodes and solar cells, Morgan State University, Department of Physics, 2015 - 2016. Rola won a full scholarship from the government of the Kingdom of Saudi Arabia to study in USA, 2014 - 2017. His primary research interests are in the nano material. She got a chance to work (NIST) as a researcher for one year.

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