Synthesis and Application of Graphene-silve Nanowires Composite for Ammonia Gas Sensing

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Graphene, consisting of a single layer of carbon in a two-dimensional (2D) lattice, is a promising material for application of nano electrical devices in recent years. In this study, we report the development of a selective, room-temperature ammonia (NH3) gas sensor based on graphene-silver nanowires "composites" coated on two planar electrode arrays. Silver nanowires was synthesized by a simple polyol method and directly coating on graphene using spraying method. The addition of Ag nanowire on graphene dramatically improve sensitivity toward NH3. Ag nanowire/ graphene shows very fast response and full recovery within several minutes under argon flow. When the ammonia molecules were absorbed at Ag hollow sites Ag nanowire, the charge transfer from Ag nanowire to graphene led to change resistance of the sensor devices.