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## Graphene loaded with ultra small nickel for hydrogen sensing

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### Abstract

Graphene loaded with ultra small nickel is successfully fabricated using E-beam evaporating by a one-step method. The morphology and structure of the composites are analyzed by field emission scanning electron microscopy, atomic force microscopy and X-ray photoelectron spectroscopy. As the oxygen-containing functional groups could act as nucleation sites, small and dense nickel nanoparticles are evenly distributed on the ultrathin graphene sheets. The as-prepared sensor based on the composites show good hydrogen gas sensing properties at room temperature. The sensitivity toward 1000 ppm hydrogen is 5%. The response and recovery time of the sensor exposed to 1000 ppm hydrogen are 140 s and 25 s, respectively. It ensures promising application in the field of hydrogen sensing in some dangerous conditions.

**Keywords:** nickel; graphene; cluster; hydrogen sensing

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