

Transient Photocurrent Measurements of Graphene Related Materials

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Abstract: Graphene is an allotrope of carbon, whose structure consists of one-atom-thick planar sheets of sp^2 -bonded carbon atoms, densely packed in a honeycomb crystal lattice. In essence, graphene is an isolated atomic plane of graphite. Graphene can be produced by mechanical exfoliation, decomposition of silicon carbide, Hummers method and it can be grown on the metallic substrates and subsequently transferred to the arbitrary substrates. Graphene is a semimetal or a semiconductor with zero bandgap. Graphene is showing excellent conductivity and high mobility ($200,000\text{cm}^2/\text{V}\cdot\text{s}$) with ambipolar transport. The two dimensional transport in graphene is evidenced by the Quantum Hall Effect. By applying electric field we can create the bandgap and as well as we can control carrier concentration. The mobility of these carriers can be measured with FET structures and from the transient photocurrent analysis using Blocking contacts.