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Hybrid graphene-organic molecule transistors with large photoresponse SHAO-YU CHEN, Institute of Atomic and Molecular Sciences, Academia Sinica, YI-YING LU, Department of Chemistry, National Taiwan University, FU-YU SHIH, Institute of Atomic and Molecular Sciences, Academia Sinica, PO-HSUN HO, CHUN-WEI CHEN, Department of Materials Science and Engineering, National Taiwan University, YANG-FANG CHEN, Department of Physics, National Taiwan University, YIT-TSONG CHEN, Department of Chemistry, National Taiwan University, WEI-HUA WANG, Institute of Atomic and Molecular Sciences, Academia Sinica, Taiwan — We present large photoresponse in hybrid graphene-organic molecule transistors, which exhibit high gain and large responsitivity. High-quality graphene phototransistors are achieved via resist-free fabrication and noncovalent bonding of the organic molecules. The photocurrent of the devices is tunable with back gate which enables high controllability by electrical means. The strong photoresponse can be attributed to charge transfer and photogating effect in the layer of organic molecules. High photo-sensitivity in the hybrid graphene-organic molecule transistors is promising for the future development of graphene-based optoelectronic applications.

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