

## Supporting Information

### **Growth and properties of large-area sulfur-doped graphene films**

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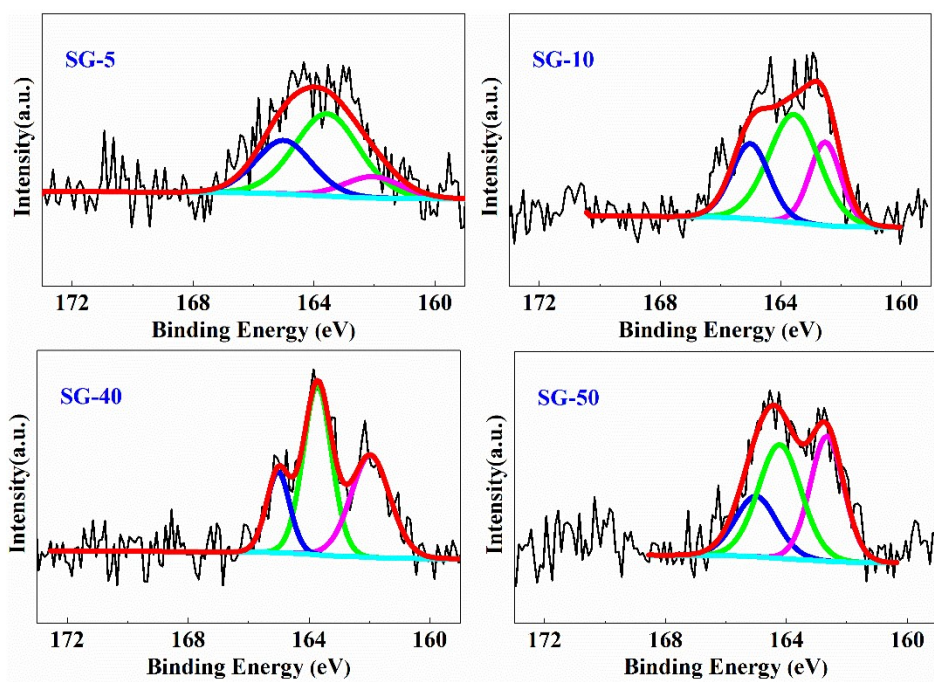


Figure S1. S<sub>2p</sub> XPS spectra of SG-5, SG-10, SG-40 and SG-50, respectively.

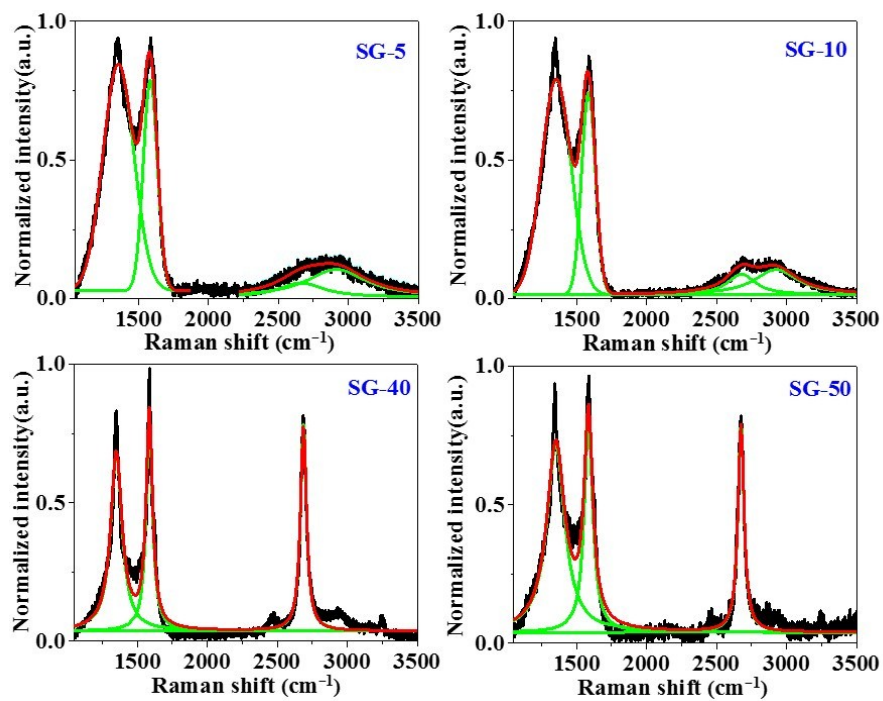


Figure S2. Raman spectra and their Lorentzian fits of SG with different hydrogen flux.

Table S1. Detail parameters of Raman spectra collected from the Lorentzian fits of SG samples

Sample	D band (cm <sup>-1</sup> )	G band (cm <sup>-1</sup> )	2D band (cm <sup>-1</sup> )	I <sub>2D</sub>	FWHM(2D) (cm <sup>-1</sup> )	I <sub>2D</sub> /I <sub>G</sub>	I <sub>D</sub> /I <sub>G</sub>	L <sub>D</sub> (nm)
SG-5	1357.21	1585.79	2679.10	0.06	256.59	0.08	1.05	11.71
SG-10	1354.17	1584.76	2677.66	0.08	242.76	0.11	1.08	11.54
SG-20	1343.96	1585.48	2681.39	0.26	50.93	0.46	1.37	10.26
SG-40	1349.52	1585.24	2687.06	0.75	51.53	0.96	0.82	13.26
SG-50	1350.80	1588.35	2683.09	0.99	31.66	1.32	0.28	22.69

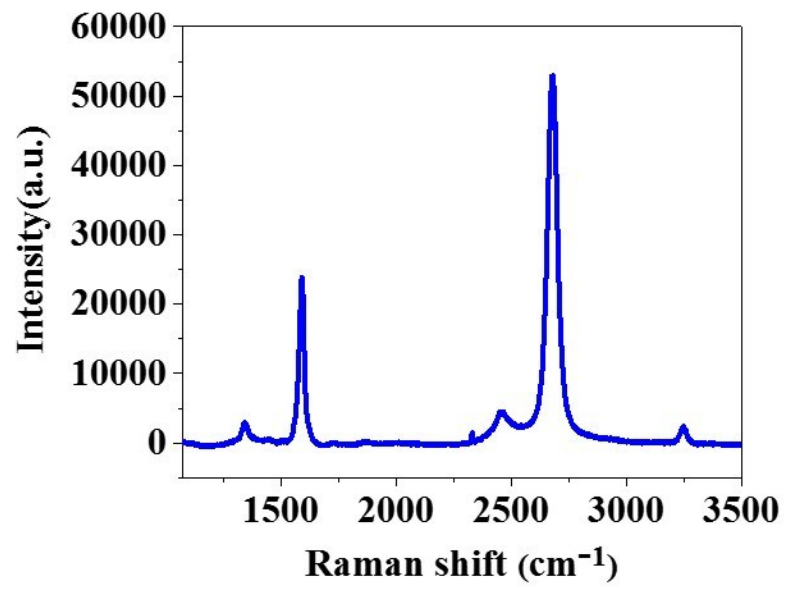


Figure S3. Raman spectra of pristine graphene.

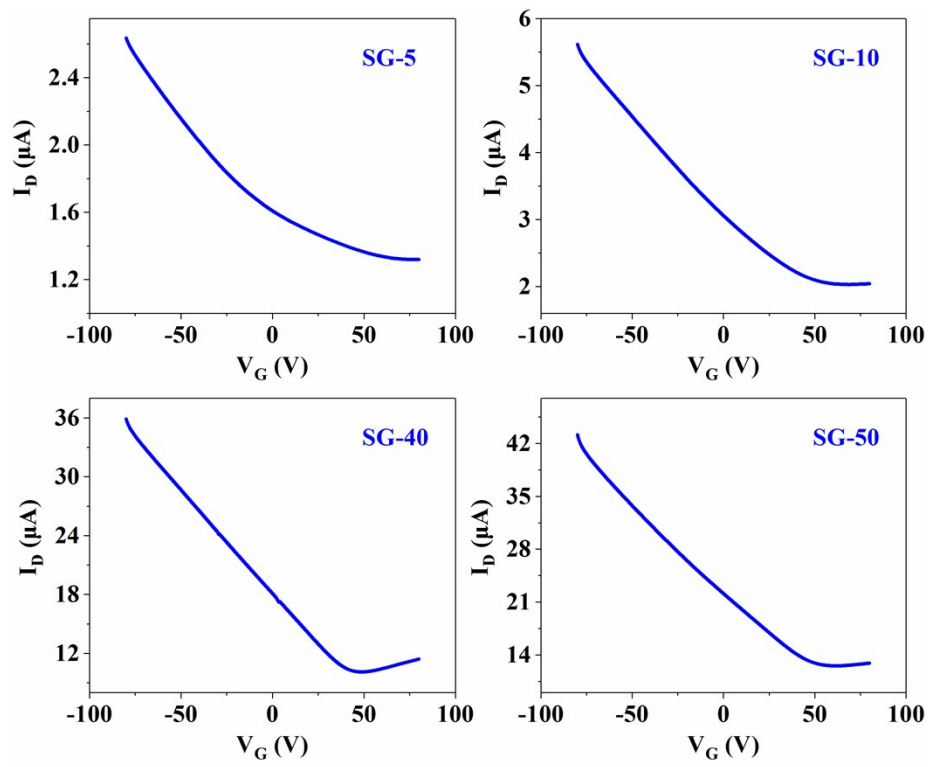


Figure S4. Transfer characteristics of the SG films based FETs.