## **Ad-layers enhance graphene's performance**

Ting-Wei Chen<sup>1</sup>, Ya-Ping Hsieh<sup>1\*</sup> and Mario Hofmann<sup>2</sup>

<sup>1</sup> Graduate Institute of Opto-Mechatronics, National Chung Cheng University,

Chiayi, 62102, Taiwan

<sup>2</sup> Department of Material Science and Engineering, National Cheng Kung

University, Tainan, 70101, Taiwan

E-mail: <a href="mailto:yphsieh@ccu.edu.tw">yphsieh@ccu.edu.tw</a>;

Figures



**Figure S1.** Effect of electropolishing on catalyst morphology: (a, b, c) Dark field Optical micrographs of Cu foil after 20, 30 and 40 minutes electropolishing.



**Figure S2.** (a)Raman spectra of graphene transferred from graphene/Cu grown with Cu foil electropolished with 10 20, 30 and 40 minutes. (b) Raman spectra of two specific points within an OM image, (inset) table with averaged  $I_{2D}/I_{G}$  ratio for both positions



**Figure S3.** Comparison of the here reported Figure of Merit at different ad-layer coverage to literature values of CVD graphene transferred using FeCl<sub>3</sub>. <sup>1-7</sup>

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