High edge nanoripple electrocatalyst via methane treatment for C2 product selectivity from CO_2

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Rising emissions of CO_2 in the atmosphere have become an increasing concern. Therefore, there are many studies including CO_2 storage and conversion. Among various apporoaches regarding CO_2 conversion, electro-reduction has high energy efficiency up to 100% in laboratory scale. Since CO_2 conversion mechanism still remains unclear, it's required to figure out what parameters afftect the conversion selectivity. Herein, we fabricated nano-ripple structure via methane pretreatment during the graphene growth which has many step sites. The nanoripple morphology has periodical slope structure with 290nm width and 16nm depth. Compared to Cu foil, ripple Cu showed high C2 product selectivity while H_2 production was suppressed. Moreover, ethylene glycol was generated upto 49%(Faradaic efficiency) at -0.8V (vs. RHE) which was rarely produced by CO_2 electro-conversion