Investigation the reaction behavior of Photocatalyst CO_2 Reduction by verify the graphene oxide surface property.

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Abstract

A key observation by controlling the surface functional group of graphene oxide under N_2 environmental condition with various treated temperature can tune the surface property of graphene oxide. However, the major function of oxygen functional groups still not clear. In this study, as-prepared graphene oxide (as-prepared GO) and modified-graphene oxide (modified-GO) has been presented. Mostly, the oxygen functional groups on the graphene oxide basal plane have been removed above 400 ^oC, but hydroxyl functional group still bond with carbon on graphene oxide edge side strongly. modified-GO is optimized by the treated temperature which perform higher CO_2RR conversion yield of C1 and C2 products also C3 product (like acetone) during the reaction process. Furthermore, CO_2 and water vapor absorption are one of the important parameters during CO_2 reduction reaction. In this regard, the CO_2 adsorption of GO and modified-GO have been done. Comparing to the GO, modified-GO shows better CO_2 absorption behavior than GO. It also provides a reference which can proof the dominated functional groups can change the surface chemistry of the carbon based photocatalyst and makes the final CO_2 conversion products different.

Keywords - Photocatalyst CO_2 reduction reaction, graphene oxide, CO_2 adsorption