Supporting Information

Nanorolls Decorated with Nanotubes as a Novel Type of Nanostructures: Fast Anodic Oxidation of Amorphous Fe-Cr-B Alloy in Hydrophobic Ionic Liquid

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2. EXPERIMENTAL SECTION

Preliminary studies of the use of the obtained material were demonstrated by the example of an electrocatalytic reaction of carbon dioxide reduction. The material containing nanorolls decorated with nanotubes was tested as a catalyst electrode. The cells and electrodes used were the same as for the synthesis of the material. Cyclic voltammetry (CV) was chosen as the most rapid and informative method. Dissolved gases were preliminarily removed from the electrolyte by purging with Ar (high purity) for 30 minutes, then the ionic liquid was saturated with CO_2 (high purity) by purging the electrolyte for 30 minutes at room temperature and atmospheric pressure.[S1-S3]

3. RESULTS AND DISCUSSION

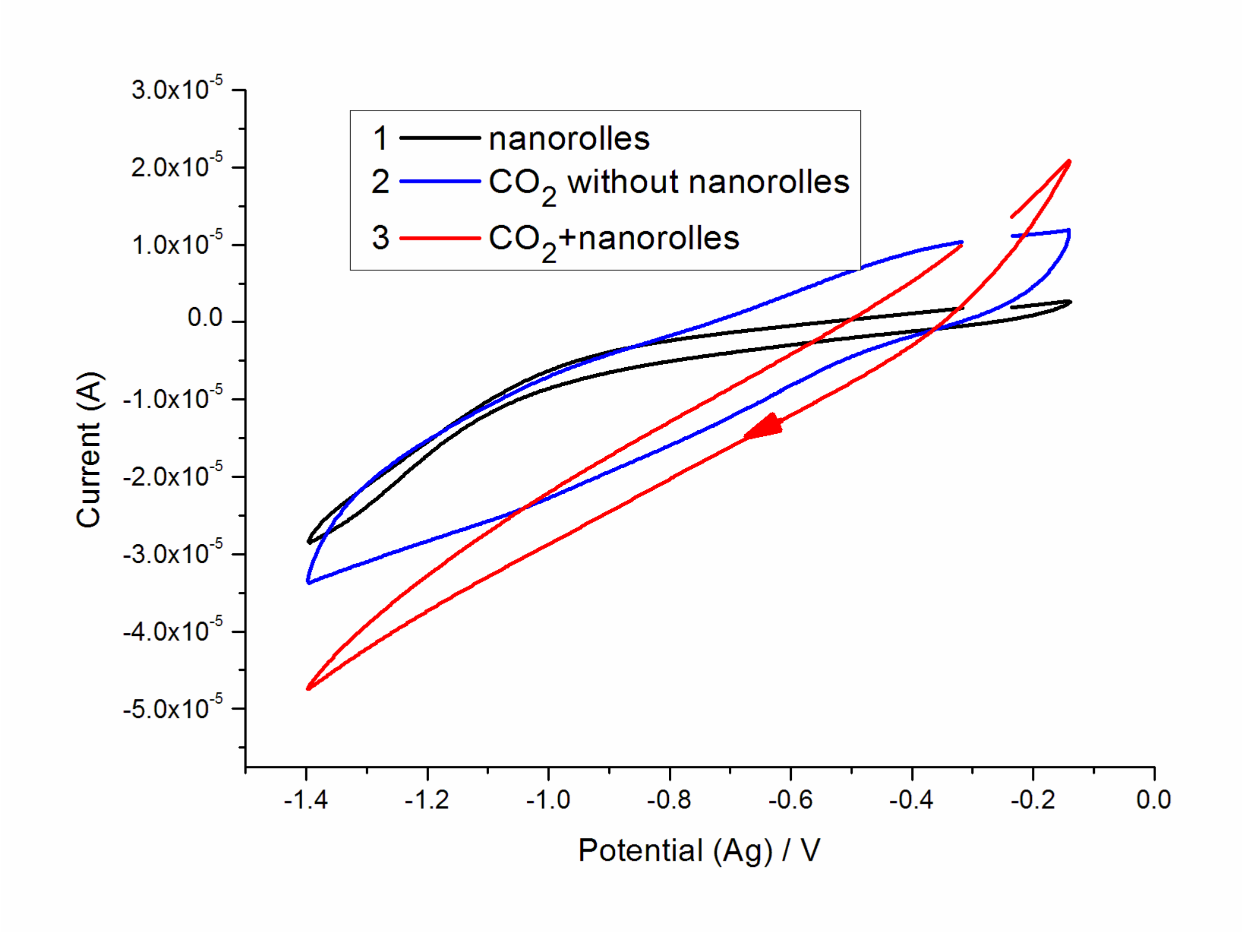

Figure S1. CV curves of different samples in the presence of CO_2.

Figure S1 (curve 1) presents CV of the Fe70Cr15B15 amorphous alloy obtained after pretreatment with 3.2 mM BA followed by anodizing in IL for 100 s in a supporting electrolyte. It is seen that CV is reversible. Figure S1 (curve 2) clearly proves reduction of CO_2 on initial amorphous alloy in the supporting electrolyte saturated with CO_2. The initial amorphous alloy demonstrates some catalytic activity in the reaction of electrocatalytic reduction of CO_2.
The current in the course of electroreduction of CO_2 at the potential of -1.3 V on the pretreated alloy is 1.5 times higher (Figure S1, curve 3) compared to the starting amorphous alloy, which is indicative of the higher catalytic activity that is determined first of all by the higher surface area.

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