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Abstract: A series of novel bimetallic copper/zirconia carbon nanofibers supported catalysts with different Cu contents (5–25 wt.%) were synthesized via deposition precipitation method. The physicochemical characterization of the calcined catalysts was carried out by X-ray diffraction, inductively coupled plasma optical emission spectroscopy, N_2 adsorption–desorption, N_2O chemisorption, temperature programmed reduction, X-ray photoelectron spectroscopy, high resolution transmission electron microscopy and temperature programmed CO_2 desorption. Structure-reactivity correlation for catalytic hydrogenation of CO_2 to methanol was discussed in details. Reaction studies revealed 15 wt.% as optimum Cu concentration for CO_2 conversion to methanol with CO_2/H_2 feed volume ratio of 1:3. Cu surface area was found to play a vital role in methanol synthesis rate. CO_2 conversion was observed to be directly proportional to the number of total basic sites. A comparative study of this novel catalyst with the recently reported data revealed the better CO_2 conversion at relatively low reaction temperature.