Abd El-Aziz Ahmed Said, Trends in Green chem 2018, Volume 4
DOI: 10.21767/2471-9889-C2-011

Influence of sonication on the catalytic activity of $Cu_xCo_{3-x}O_4$ nanocatalysts for conversion of CO into CO_2 efficiently

Abd El-Aziz Ahmed Said
Assiut University, Egypt

In this work, the incorporation of CuO into Co_3O_4 ($CuxCo_{3-x}O_4$, $3.0 \leq x \geq 0.0$) is presented as promoter to obtain highly active and stable nanocatalysts towards the catalytic conversion of CO into CO_2. The pure and mixed oxides were prepared by co-precipitation-sonication method using K_2CO_3 as precipitant. The catalysts were characterized by TG-DTA, XRD, BET, HRTEM, electrical conductivity and surface chemisorbed oxygen measurements. The results revealed that the addition of CuO (x=0.0-0.75) to Co_3O_4 monotonically increases the specific surface area, the amount of surface chemisorbed oxygen, electrical conductivity and catalytic activity of the nanocatalysts. The role of the active redox sites existed in these nanocatalysts such as Co^{3+}/Co^{2+}, Cu^{2+}/Cu^{+} and Co^{3+}/Cu^{+} which are responsible for such modification was discussed. In addition, the catalytic activity indicated that $Cu_{0.75}Co_{2.25}O_4$ nanocatalyst calcined at 400 exhibited the highest catalytic activity with total conversion of CO into CO_2 at 125. Furthermore, the $CuxCo_{3-x}O_4$ catalysts also display high catalytic long-term stability. Finally the effects of various operational parameters were also studied.

Biography

Abd El-Aziz Ahmed Said completed his PhD from Assiut University and Postdoctoral studies from Tokyo Institute of Technology, Japan. He is the Director of Material Science and Nanotechnology Center, Faculty of Science and Former Dean of Faculty of Science, Assiut University. He has published more than 110 papers in reputed journals and has been serving as Editorial Board Member of repute.

aasaid55@yahoo.com

Notes: