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Copper Tricomponent Catalysts Application for Hydrogen Production from Ethanol

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The application of copper-based catalysts in the production of pure hydrogen in the steam reforming of ethanol was performed. The tricomponent Cu/Zr catalysts with about 4 mass% addition of nickel, cobalt, or cerium have been prepared in our laboratory. The properties of obtained catalysts were compared with bimetallic Cu/Zr catalyst prepared and tested according to the same procedure. Catalytic tests were carried out in the continuous flow fixed–bed reactor in the wide temperature range of 433–593 K for initial molar ratio of ethanol to water equal to 1:3. Catalysts were characterized by XRD, TPR, CO2–TPD, and TPO methods. Cu/Zr/Ce catalyst proved to be the best; hydrogen yield reached the value of 400 L/(kgcat.•h), selectivity towards carbon monoxide was below 0.5% and the one towards methane wasnot detected. Additions of Ni or Co did not bring significant improvement in activity.

Metryczka

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