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ACCEPTED MANUSCRIPT

Direct synthesis of acetic acid by simultaneous co-activation of methane and CO_2 over Cu-exchanged ZSM-5 catalysts

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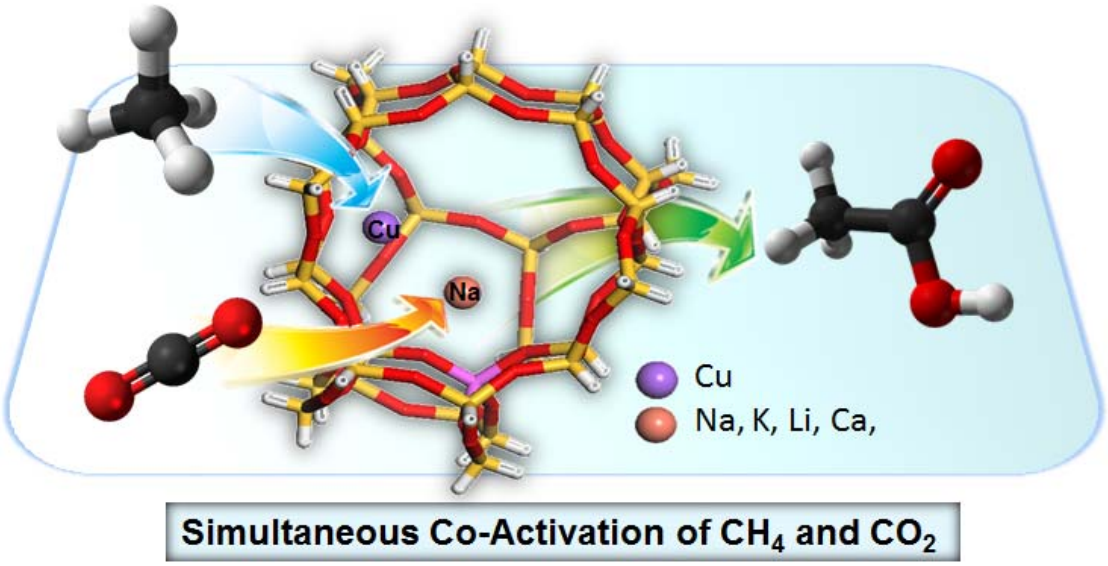
Graphical Abstract



Highlights:

- Simultaneous activation of CH_4 and CO_2 by concurrent feeding over Cu-cation-ZSM-5.
- Cu-M^+-ZSM-5 catalysts were proven to activate CH_4 and CO_2 simultaneously.
- The acetic acid formation was in order K > Na > Ca > Li concerning cationic species.
- The catalyst activity was recovered up to more than 70% due to re-dispersion of Cu.

Abstract:

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