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## Process and mechanism of toluene oxidation using $\text{Cu}_{1-y}\text{Mn}_2\text{Ce}_y\text{O}_x$ /sepiolite prepared by the co-precipitation method

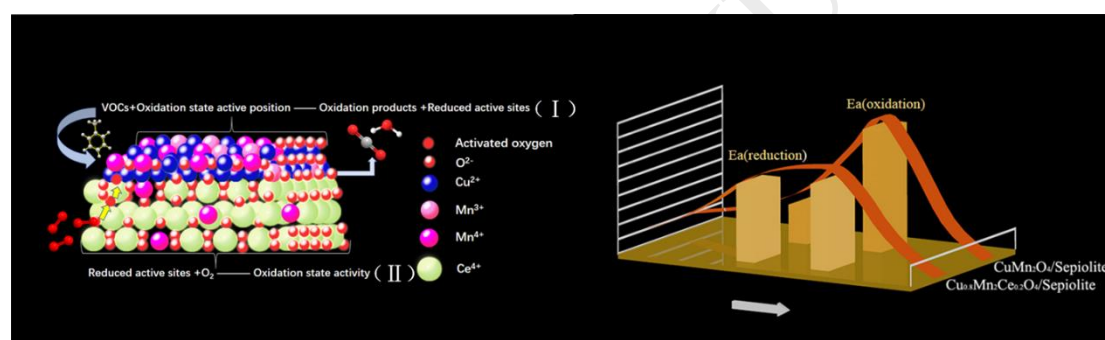
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### Graphical Abstract



### Highlights

- $\text{Cu}_{1-y}\text{Mn}_2\text{Ce}_y\text{O}_x$ /sepiolite catalysts showed high activity for toluene oxidation.
- Mn species valence distribution and defects of catalysts were studied.
- The catalytic kinetics were calculated by MVK model.
- Two steps of the MVK model were studied in depth.

### Abstract

To achieve efficient degradation of toluene, a series of  $\text{Cu}_{1-y}\text{Mn}_2\text{Ce}_y\text{O}_x$ /sepiolite catalysts ( $y=0.1, 0.2, \text{ and } 0.3$ ) with different  $\text{Cu}_{1-y}\text{Mn}_2\text{Ce}_y\text{O}_x$  loadings (10%, 20%, and 30%) were prepared via the co-precipitation method. The structure-activity and surficial elemental species of  $\text{Cu}_{1-y}\text{Mn}_2\text{Ce}_y\text{O}_x$ /sepiolite were characterized by XRD, TEM, SEM, BET, ICP-MS and XPS. The

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