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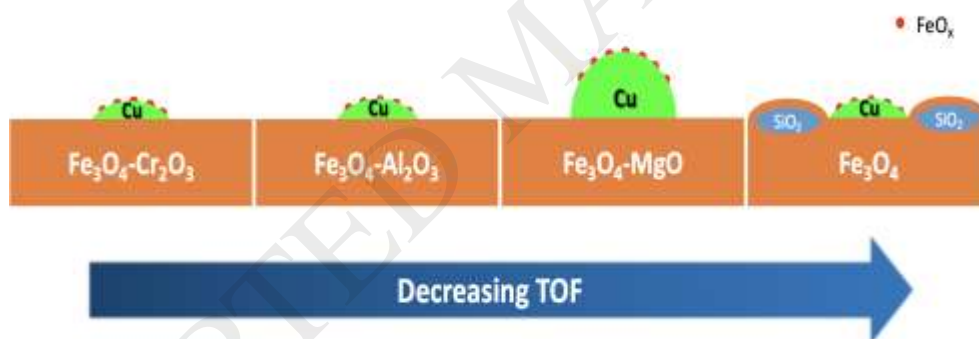
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Graphical abstract



Highlights:

- Structure-activity relationships revealed for Cr-free $\text{CuO-MO}_x\text{-Fe}_2\text{O}_3$ catalysts
- MgO forms solid solution with iron oxides exhibiting poor thermostability and TOF
- SiO_2 is incompatible with iron oxide lattice and decreases activity of surface oxygen

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