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Structured microreactor with gold and palladium on titania: active, regenerable and durable catalyst coatings for the gas-phase partial oxidation of 1-butanol

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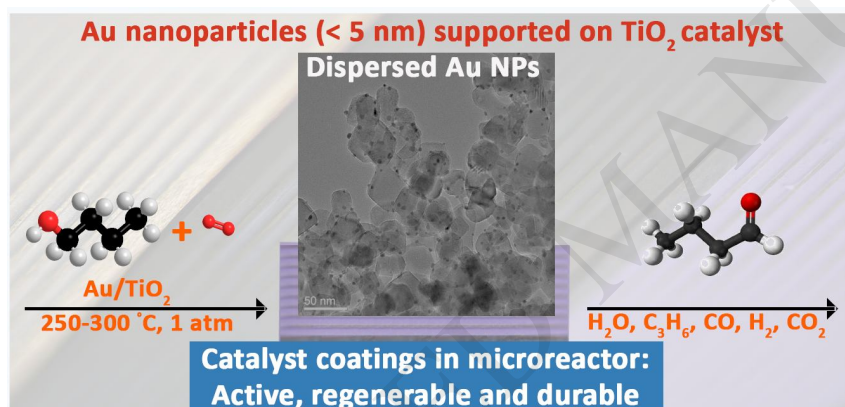
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Graphical Abstract



Highlights

- New catalyst coatings of titania-supported mono- and bimetallic gold and palladium
- All noble metal coatings were active for gas phase partial oxidation of 1-butanol
- Gold nanoparticle catalyst on titania was most selective to *n*-butyraldehyde
- Regenerability of the coated catalyst provided reusable structured microreactors
- The catalytic activity of 0.6 wt% Au/TiO₂ could be fully recovered in 57 tested runs
- A reaction scheme for gas-phase 1-butanol partial oxidation was proposed

Abstract

Structured microreactors coated with catalytically active porous layers have emerged as a promising replacement for conventional reactors because they are inherently safe to operate in nearly isothermal

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