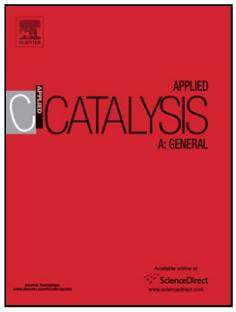

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Fischer-Tropsch synthesis: foregoing calcination and utilizing reduction promoters leads to improved conversion and selectivity with Co/silica

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Highlights

- Air calcined Co/SiO_2 produce large, easily reduced, Co particles and low Co site densities.
- Direct reduction of cobalt nitrate particles on silica yield small, difficult to reduce, Co particles.
- TPR-MS/EXAFS/XANES reveal a Co oxide spinel is formed by NO_2 oxidation, reducing to CoO and Co^0.
- Pt addition facilitates reduction of small Co oxides formed during direct nitrate reduction.
- Direct Co nitrate reduction: adding Pt greatly increases Co site density and X_{CO}; improves selectivity.