Supplementary Material (ESI) for Chemical Communications


# Supporting Information

## Facile Synthesis of Carbon Nanotube/Natural Bentonite Composites as a Stable Catalyst for Styrene Synthesis

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**Table S1**. Concentrations of chemical elements in the fresh bentonite.

| Elements | Atomic% | Weight% |
|---|---|---|
| O | 46.07 | 28.57 |
| Na | 0.74 | 0.66 |
| Mg | 2.34 | 2.20 |
| Al | 9.19 | 9.60 |
| Si | 25.41 | 27.66 |
| K | 0.97 | 1.46 |
| Ca | 4.35 | 6.76 |
| Mn | 0.10 | 0.22 |
| Fe | 8.76 | 18.97 |
| Ti | 1.78 | 3.30 |
| Ni, Cu, Zn, Co, Zr, Sr | <0.09 | |

**Table S2**. BET surface area of various samples.

| Sample | BET surface area ($m^2/g$) |
|---|---|
| As-received bentonite | 88.7 |
| Reduced-bentonite | 10.1 |
| CNTs/bentonite | 33.1 |
| Commercial CNTs | 282 |

**Figure S1**. Characterization results of grown carbon nanotubes in CNTs/bentonite composite: (a-b) TEM images (scale bar: 5nm), (c) distribution of the outer diameter, and, (d) DTG and the produced $CO_2$ profiles in a thermogravimetric analysis. Condition: 5.5mg, 5°C/min, 5% $O_2$ in Ar.

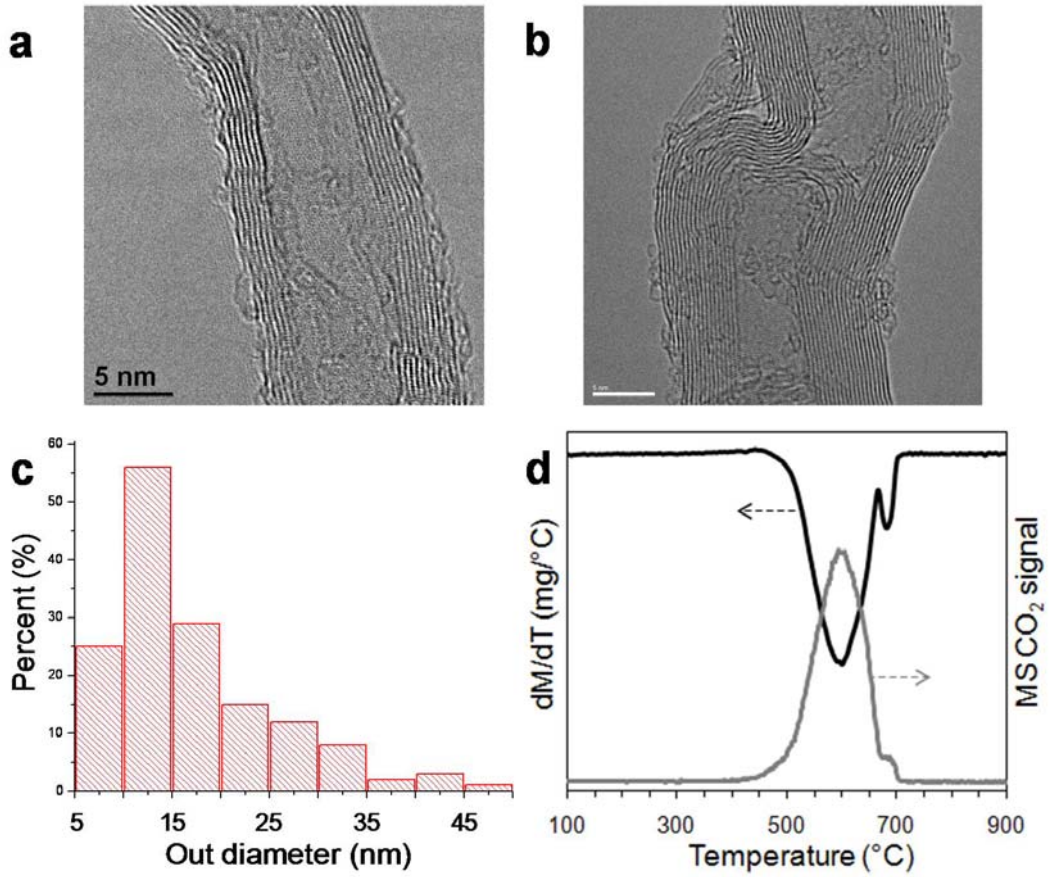

**Figure S2**. Photographs representation of exfoliating sample after synthesis of CNT.

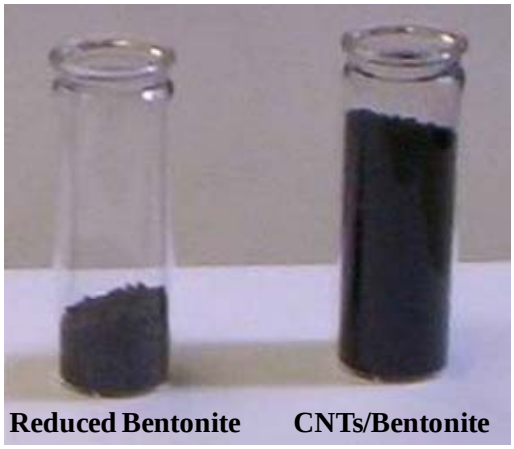

**Figure S3**. Carbon balance of ODH reaction of ethylbenzene on CNT/Bentonite and commercial AC in Fig. 5.

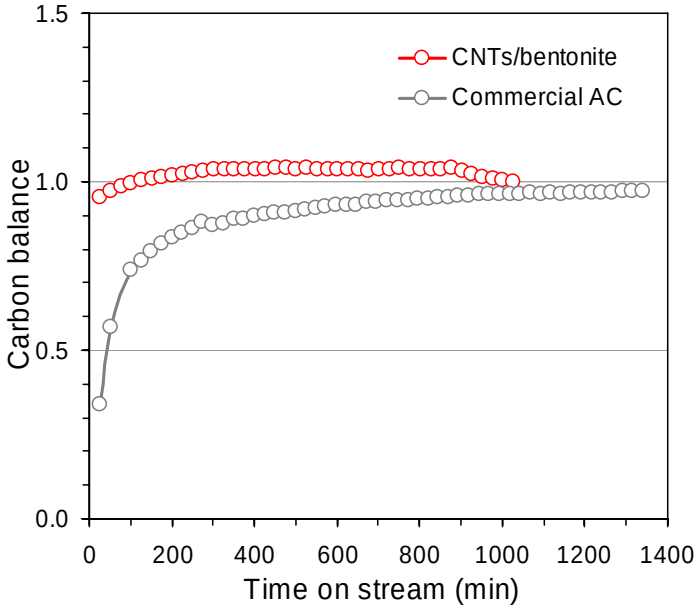

**Figure S4**. TEM images of CNTs and CNTs-encapsulated Fe particles after ODH reaction in Fig. 5.