Supplementary information

Unexpected highly reversible topotactic CO$_2$ sorption/desorption capacity for potassium dititanate

Qianwen Zheng$^1$, Liang Huang$^1$, Yu Zhang$^1$, Junya Wang$^1$, Chen-Zi Zhao$^2$, Qiang Zhang$^2$, Weijie Zheng$^3$, Dapeng Cao$^3$, Dermot O’Hare$^4$, Qiang Wang$^1$.*

$^1$College of Environmental Science and Engineering, Beijing Forestry University, 35 Tsinghua East Road, Haidian District, Beijing 100083, P. R. China
$^2$Department of Chemical Engineering, Tsinghua University, 1 Tsinghua Road, Haidian District, Beijing 100084, P. R. China
$^3$Division of Molecular and Materials Simulation, State Key Laboratory of Organic–Inorganic Composites, Beijing University of Chemical Technology, Beijing 100029, P. R. China
$^4$Chemistry Research Laboratory, Department of Chemistry, University of Oxford, Mansfield Road, Oxford OX1 3TA, United Kingdom

*Corresponding author:
Professor Qiang Wang, College of Environmental Science and Engineering, Beijing Forestry University, 35 Qinghua East Road, Haidian District, Beijing 100083, P. R. China
Tel.: 86-13699130626
E-mail: qiang.wang.ox@gmail.com; qiangwang@bjfu.edu.cn
Figure S1. One CO$_2$ sorption/desorption cycle over K$_2$Ti$_2$O$_5$ both tested at 750 °C, which clearly indicates that the regeneration of the adsorbent K$_2$Ti$_2$O$_5$ in N$_2$ is very rapid (< 6 min).
Figure S2. SEM images of (a) fresh K$_2$Ti$_2$O$_5$, and (b) K$_2$Ti$_2$O$_5$ thermally treated at 750 °C in N$_2$ for 10.0 h.
Figure S3. XRD patterns of fresh K$_2$Ti$_2$O$_5$, the mixture of K$_2$Ti$_4$O$_9$ and K$_2$CO$_3$, and the thermally treated mixture of K$_2$Ti$_4$O$_9$ and K$_2$CO$_3$ with a ratio of 1:1 at 750 °C for 1.0, 2.0, 5.0, and 10.0 h, respectively, (•) K$_2$CO$_3$. 