

Supporting Information for

Hydrogen Storage and Selective Carbon Dioxide Capture in a New Chromium(III)-Based Infinite Coordination Polymer

Jian Zhang,^a Lixian Sun,^{*a} Fen Xu,^{*b} Fen Li,^a Huai-Ying Zhou,^c Feng-Lei Huang,^d Zelimir Gabelica^e and Christoph Schick^f

^[a] Materials and Thermochemistry Laboratory, Dalian National Laboratory for Clean Energy, Dalian Institute of Chemical Physics, 457 Zhongshan Road, Dalian, 116023, China;

^[b] Institute of Chemistry for Functionalized Materials, College of Chemistry and Chemical Engineering, Liaoning Normal University, 850 Huanghe Road, Dalian, 116029, China.

^[c] Department of Material Science & Engineering, Guilin University of Electrical Technology, Guilin 541004, China

^[d] State Key Laboratory of Explosion Science and Technology, Beijing Institute of Technology, Beijing 100081, China

^[e] Université de Haute Alsace, ENSCMu, Lab. LPI-GSEC, 3, Rue A. Werner, F-68094, Mulhouse Cedex, France.

^[f] Institute of Physics, Universität Rostock, Rostock D-18059, Germany.

*E-mail: lxsun@dicp.ac.cn; xufen@lnnu.edu.cn;

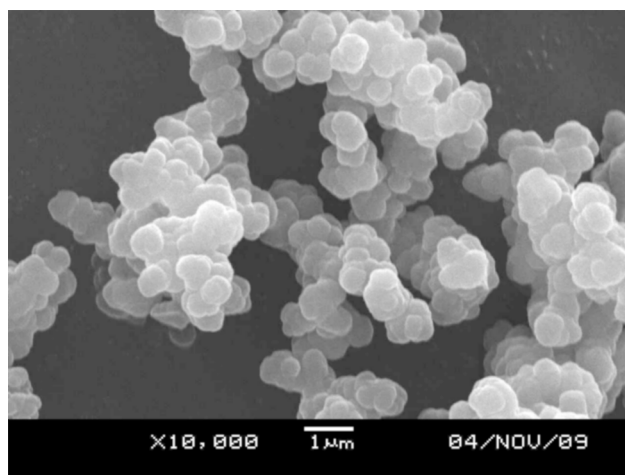


Figure S1. SEM image of infinite coordination polymer particles obtained using a volume ratio of 1,4-dioxane to DMF, 25:75.

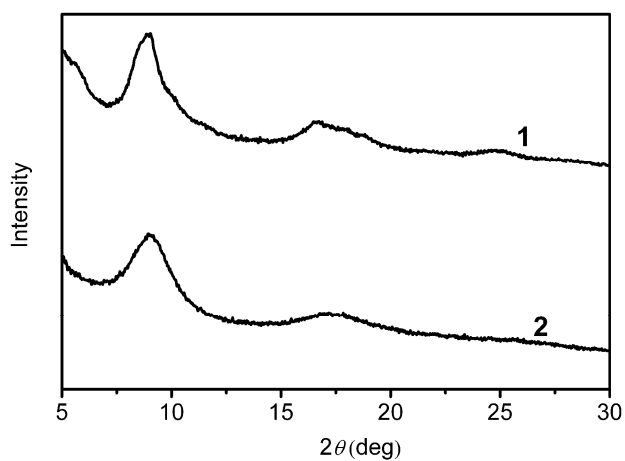


Figure S2. Powder XRD patterns of samples 1 and 2.

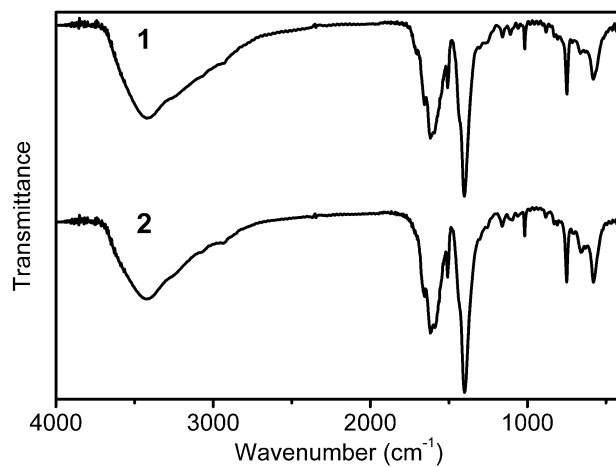


Figure S3. Infrared spectra of samples **1** and **2**.

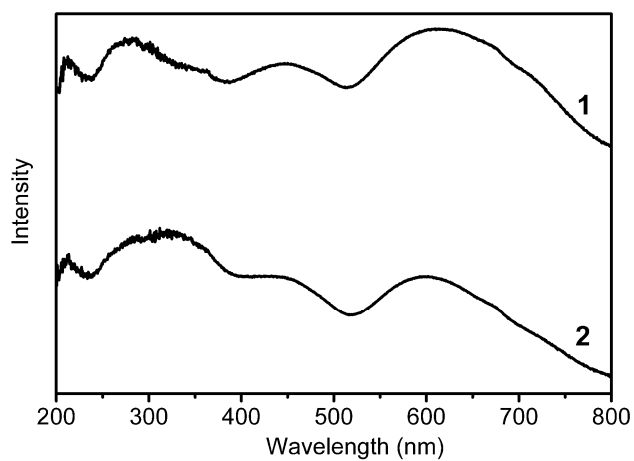


Figure S4. Solid-state UV-Vis spectra of samples **1** and **2**.

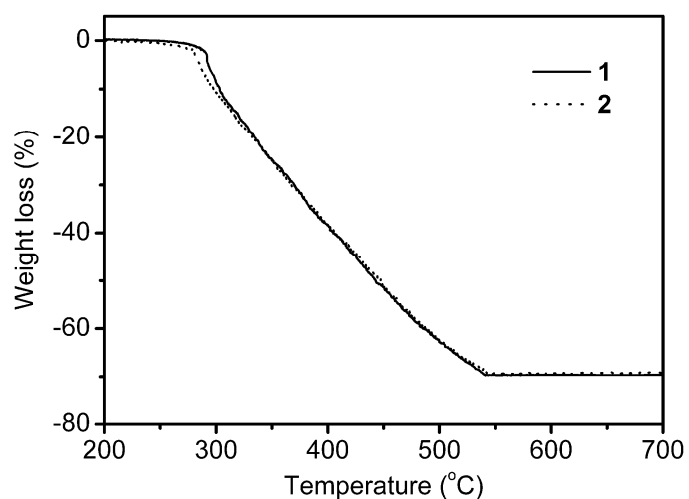


Figure S5. TG profiles of samples **1** and **2** (heating rate: 10 °C min⁻¹ in air flow).

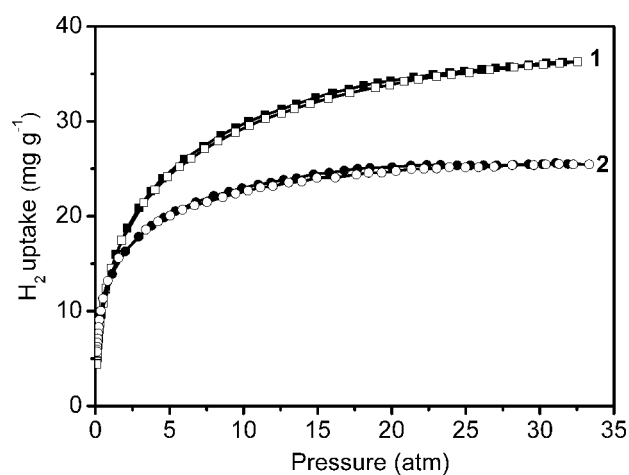


Figure S6. High-pressure hydrogen adsorption isotherms for samples **1** (squares), and **2** (circles) at 77 K over a pressure range of 0-33 atm. In the isotherms, solid and open markers represent adsorption and desorption points, respectively.

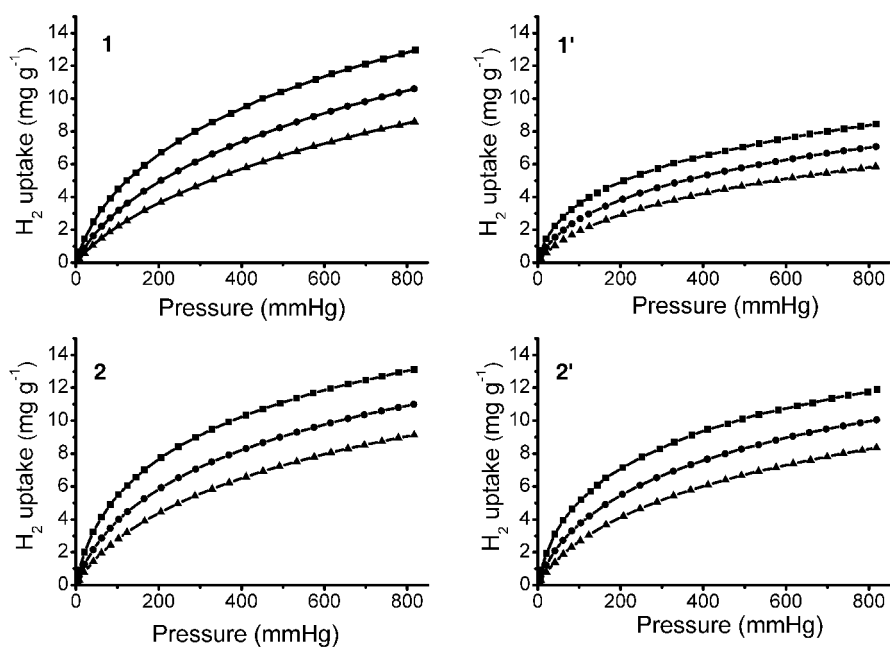


Figure S7. Low-pressure hydrogen adsorption isotherms for samples **1**, **1'**, **2** and **2'** at 80 K (squares), 85 K (circles) and 90 K (triangles).

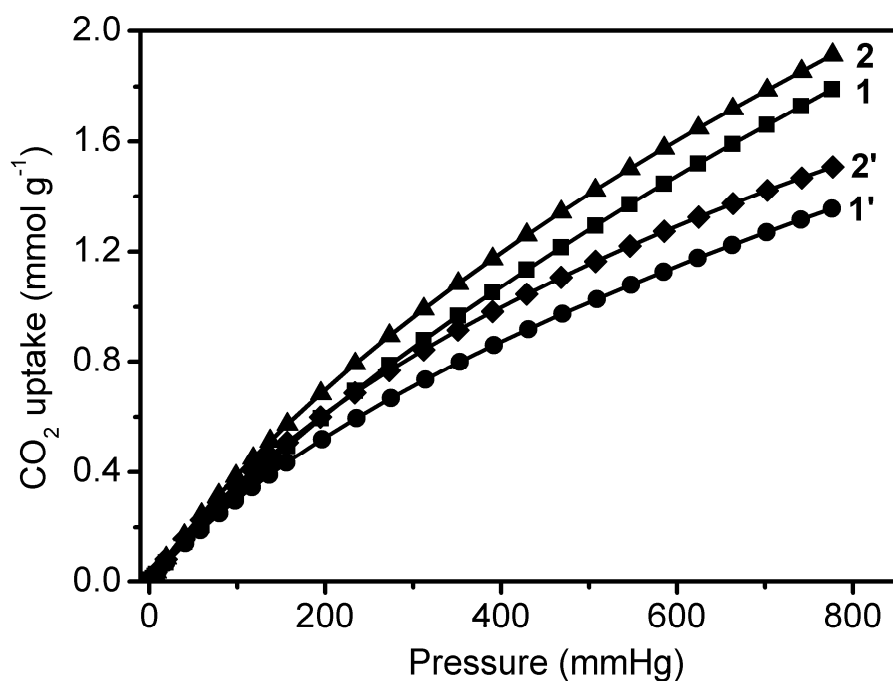


Figure S8. Low-pressure CO₂ adsorption isotherms for samples **1**, **1'**, **2** and **2'** at 295 K.

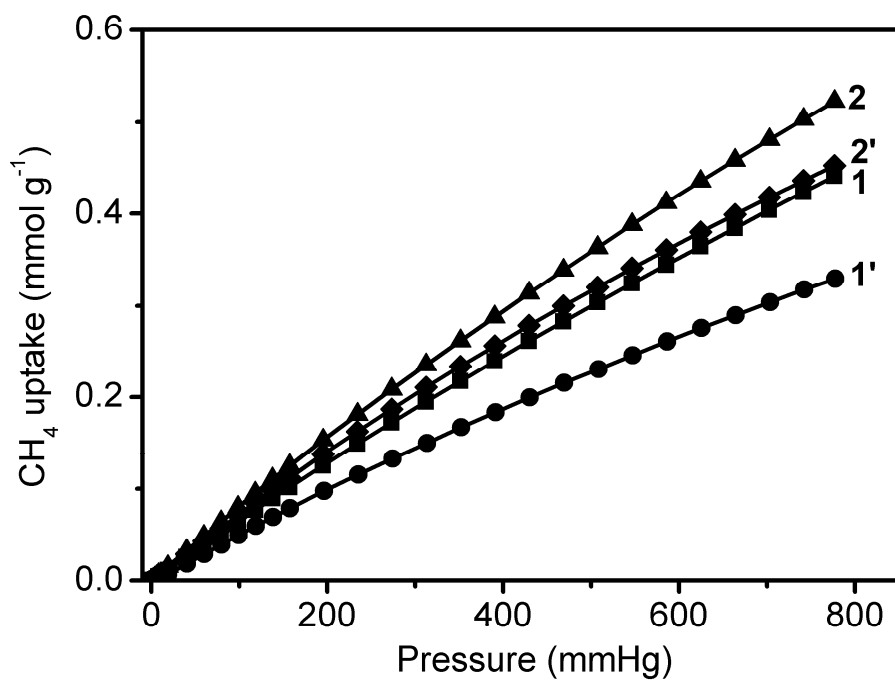


Figure S9. Low-pressure CH₄ adsorption isotherms for samples **1**, **1'**, **2** and **2'** at 296 K.