Electronic Supplementary Information (ESI):

Synthesis of porous In_2O_3 microspheres as sensitive materials for early warnings of hydrocarbon explosion

Yang Cao[a,‡], Jun Zhao[a,c,‡], Xiaoxin Zou[a], Pan-Pan Jin[a], Hui Chen[b], Ruiqin Gao[a], Li-Jing Zhou[a], Yong-Cun Zou* and Guo-Dong Li[a]

[a]State Key Laboratory of Inorganic Synthesis and Preparative Chemistry, College of Chemistry, Jilin University, 2699 Qianjin Street, Changchun 130012, China E-mail: zouyc@jlu.edu.cn (Yong-Cun Zou)

[b]School of Materials Science and Engineering, China University of Mining and Technology, Xuzhou 221000, China

[c]College of Science, Hebei University of Science and Technology, Shijiazhuang 050018, China

‡ The authors contributed equally to this work.

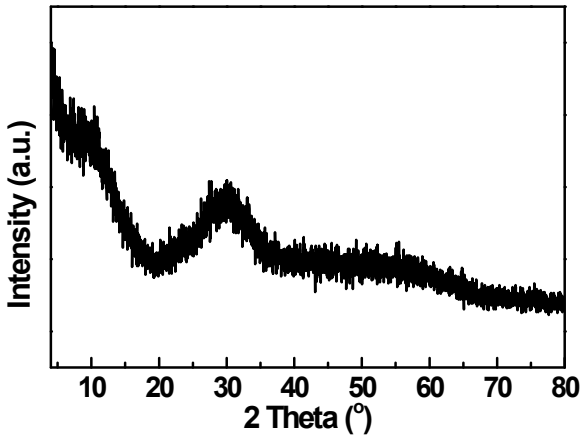

Figure S1 XRD pattern of In-gly. The result demonstrates the In-gly precursor possesses an amorphous structure.

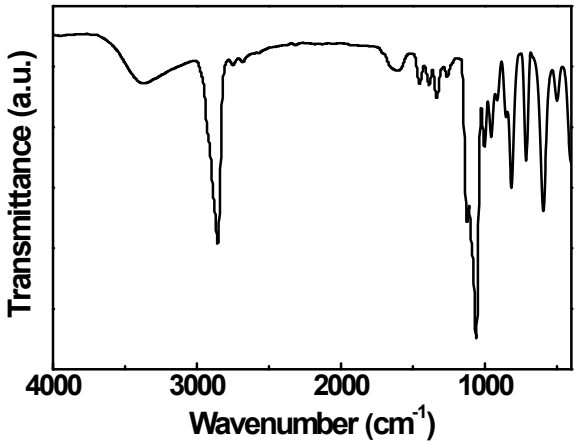

Figure S2 IR spectrum of In-gly. The broad IR absorption band at ~3390 cm^{-1} is attributed to hydrogen-bound hydroxyl groups, and the absorption band at ~2850 cm^{-1} is characteristic of the C-H stretching vibrations. In addition, all the bands located below 2000 cm^{-1} are generally assigned to In-O, C-C, C-C-O and C-O-In groups. Similar IR results were also observed previously for other metal alkoxides (Nanoscale, 2014, 6, 7255; Dalton Trans., 2013, 42, 4365; Dalton Trans., 2013, 42, 14357).

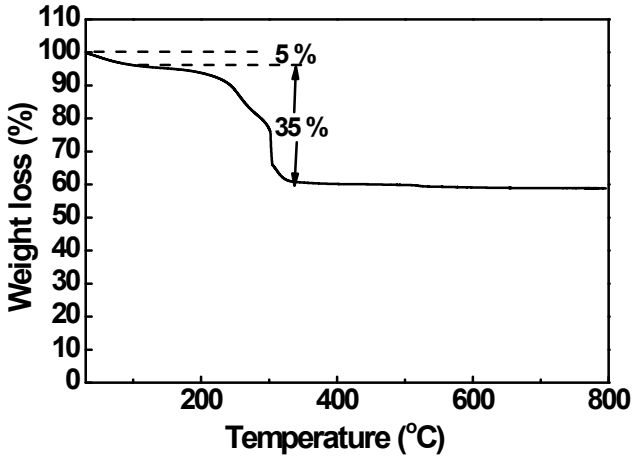

Figure S3 TG curve of In-gly measured in air from 25 to 800 °C. Before 100 °C, the weight loss of 5% can be attributed to evaporation of the absorbed organic residues and water species on the In-gly surface. The In-gly precursor completely decomposed at around 350 °C with a total weight loss of ~35 %. From the weight loss values it is estimated that the indium content in the In-gly precursor is ~46.6 wt.%.

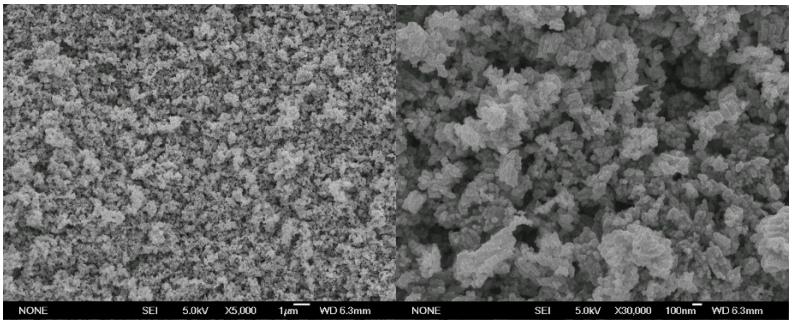

Figure S4 SEM images of com-In_2O_3.