Electronic Supplementary Information

Rational fabrication of graphitic-C_3N_4/$Sr_2KNb_5O_{15}$ nanorod composite with enhanced visible-light photoactivity for degradation of methylene blue and hydrogen production

Ping Wang,[*,a,b] Ilya Sinev,[c] Feng Sun,[a] Huijun Li,[a] Ding Wang,[a] Qian Li,[d] XianYing Wang,[a] Roland Marschall,[b,e] Michael Wark[*,b,f]

a. School of Materials Science and Technology, University of Shanghai for Science and Technology, Jungong Road 516, 200093, Shanghai, P.R. China

b. Laboratory of Industrial Chemistry, Ruhr-University Bochum, Universitaetsstrasse 150, 44801 Bochum, Germany

c. Department of Physics, Ruhr-University Bochum, Universitaetsstrasse 150, 44801 Bochum, Germany

d. Materials Genome Institute, Shanghai University, Shangda Road 99, 200444 Shanghai, P.R. China

e. Institute of Physical Chemistry, Justus-Liebig-University Giessen, Heinrich-Buff-Ring 58, 35392 Giessen, Germany

f. Institute for Chemistry, Chemical Technology 1, Carl von Ossietzky University Oldenburg, Carl-von-Ossietzky-Str. 9-11, 26129 Oldenburg, Germany

*Corresponding authors: E-mail: ping.wang@usst.edu.cn (P.W.), michael.wark@uni-oldenburg.de (M.W.)

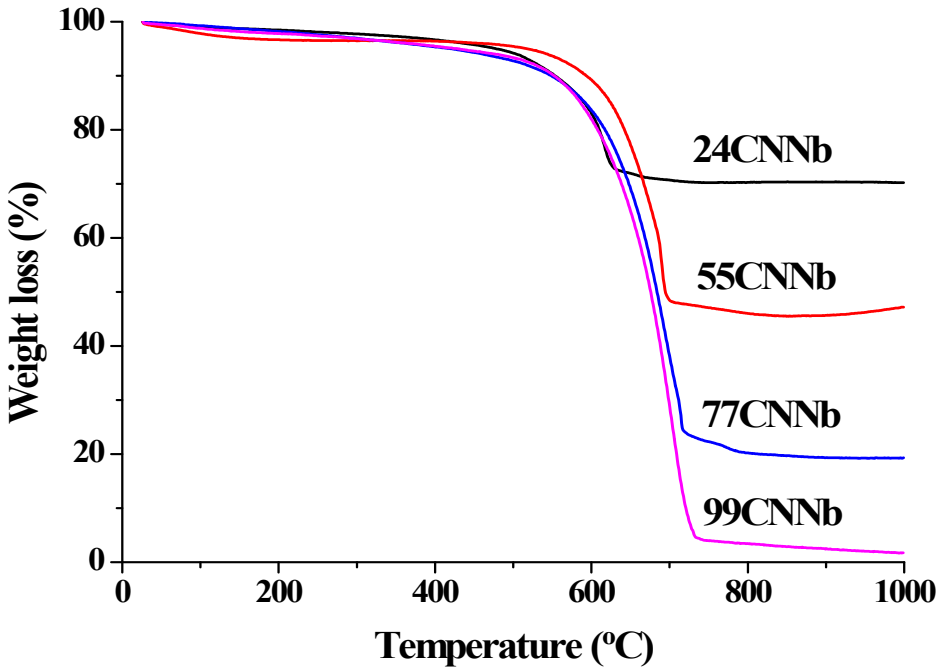
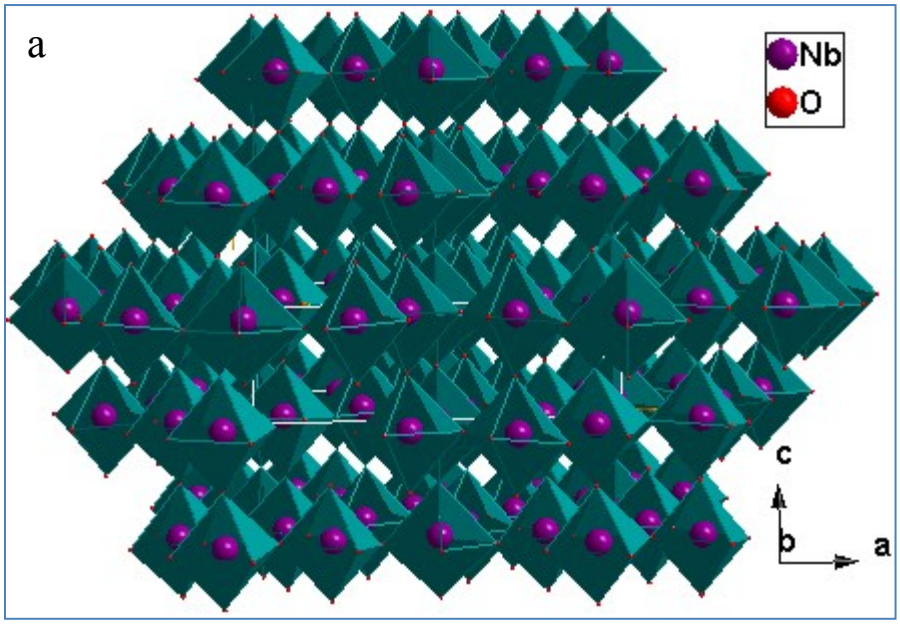


Figure S1. TG curves of the g-C_3N_4/$Sr_2KNb_5O_{15}$ nanocomposite samples with different g-C_3N_4 content.



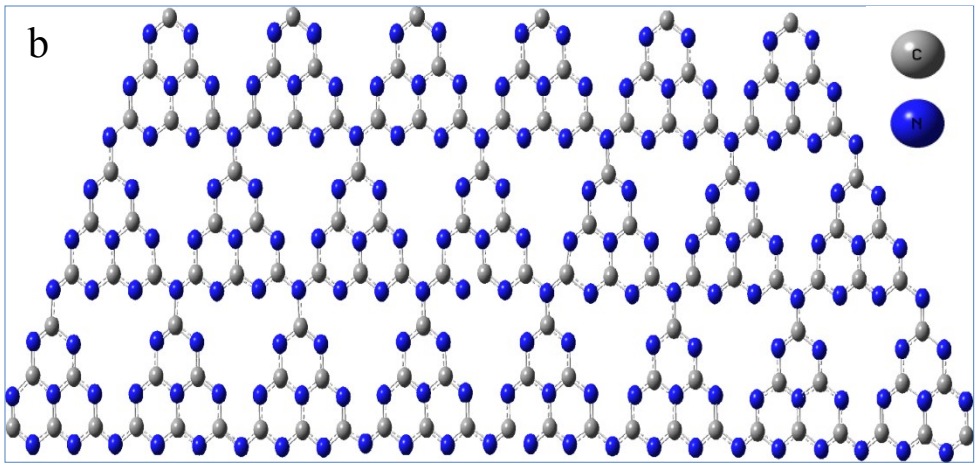


Figure S2. Schematic diagram of crystal structure: a) the tetragonal tungsten bronze $Sr_2KNb_5O_{15}$ along [001] direction, consists of a framework of corner-shared NbO_6 octahedral and three cationic tunnels A1, A2, and A3 (In general, A1 and A2 sites are partially occupied by Sr and K atom and partially vacant, and A3 sites are often vacant) and b) [002] facet of a perfect graphitic carbon nitride sheet constructed from melem units.

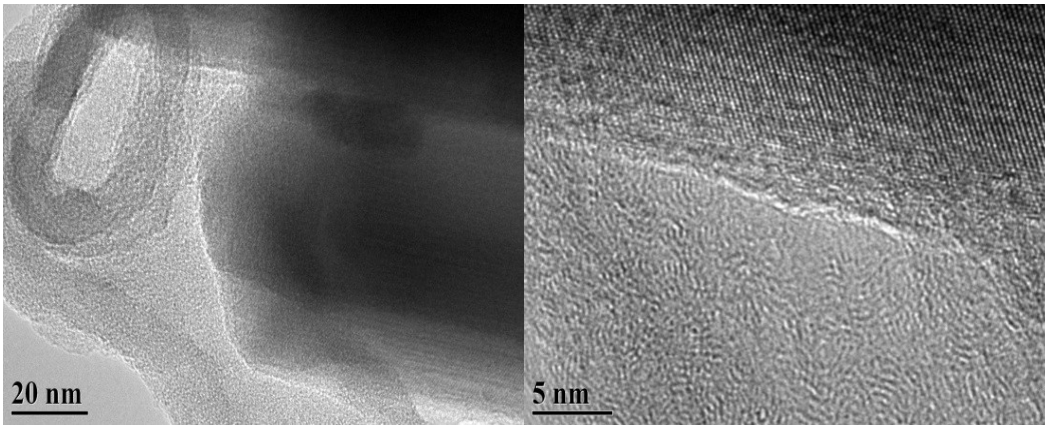


Figure S3. The HRTEM images of 77CNNb nanocomposite sample.

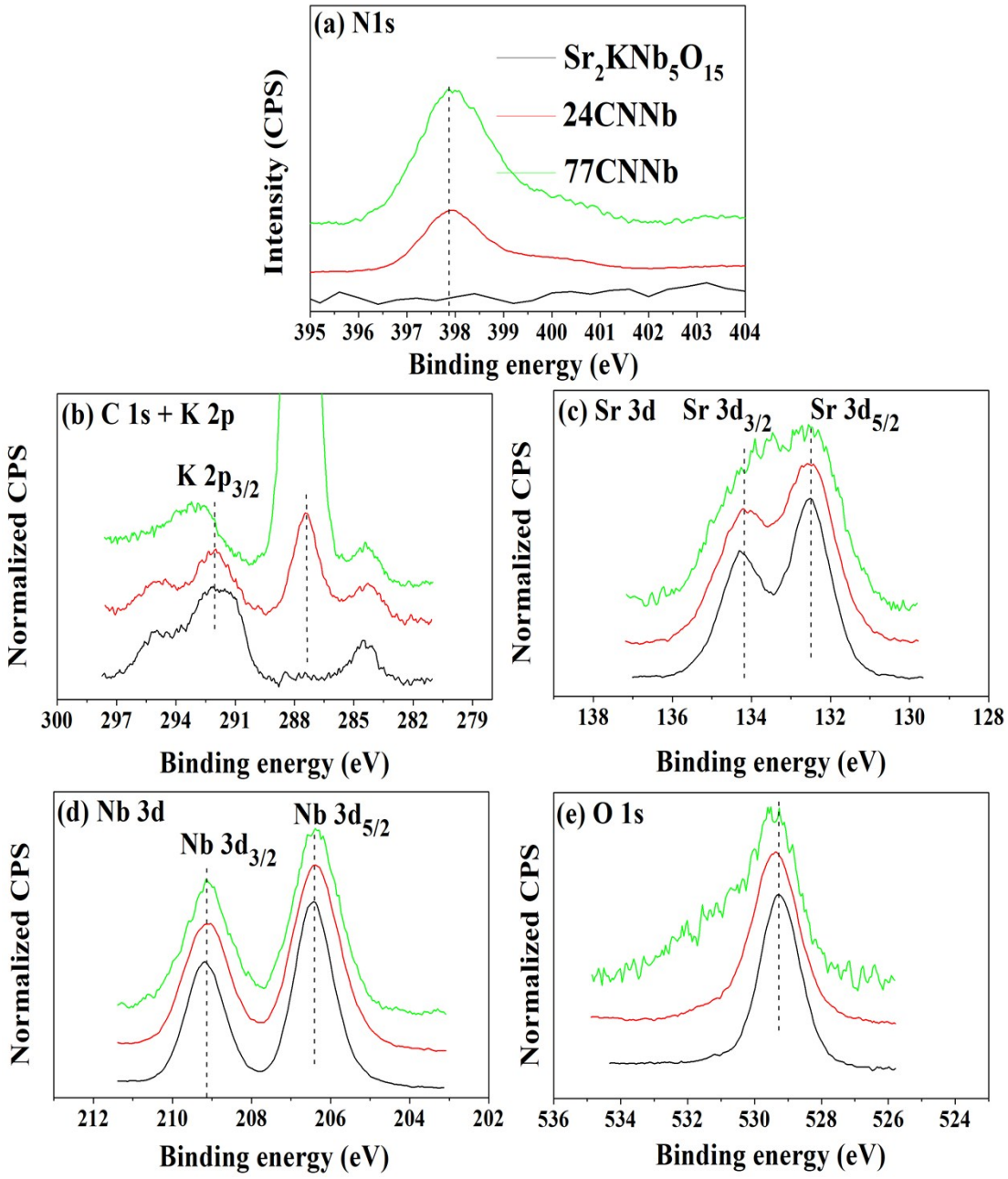


Figure S4. Binding energy of N 1s (a), C 1s and K 2p (b), Sr 3d (c), Nb 3d (d) and O 1s (e) in the XPS spectra of bare $Sr_2KNb_5O_{15}$, 24CNNb and 77CNNb nanocomposites.

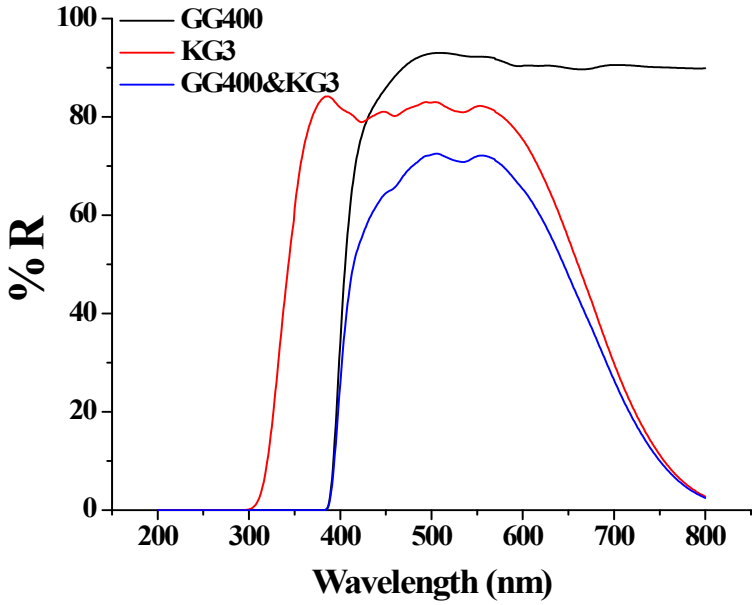


Figure S5. The wavelength distribution of the irradiation light employed in the MB decomposition experiments.

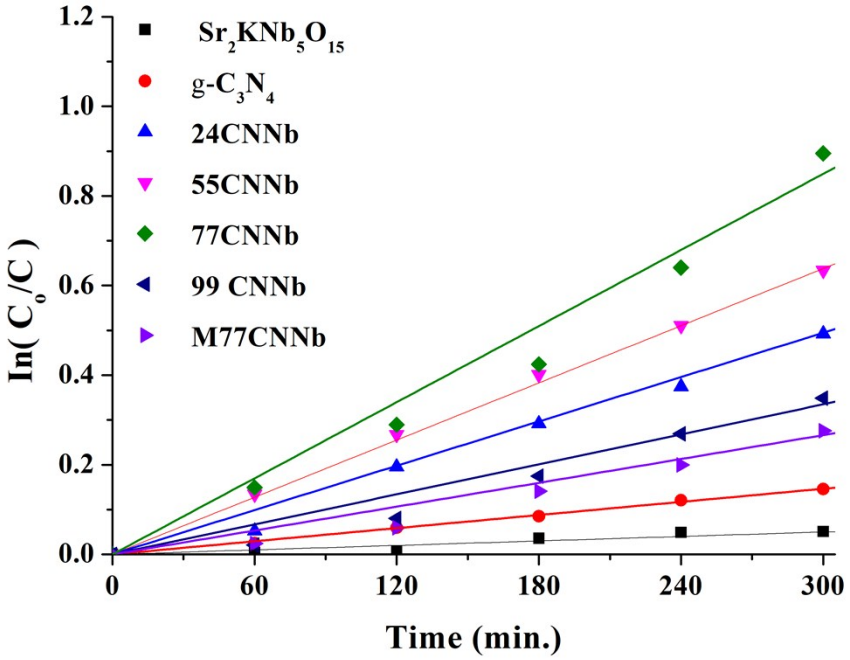


Figure S6. The photodegradation process of MB on the as-synthesized samples as fitted by the first-order kinetics model.

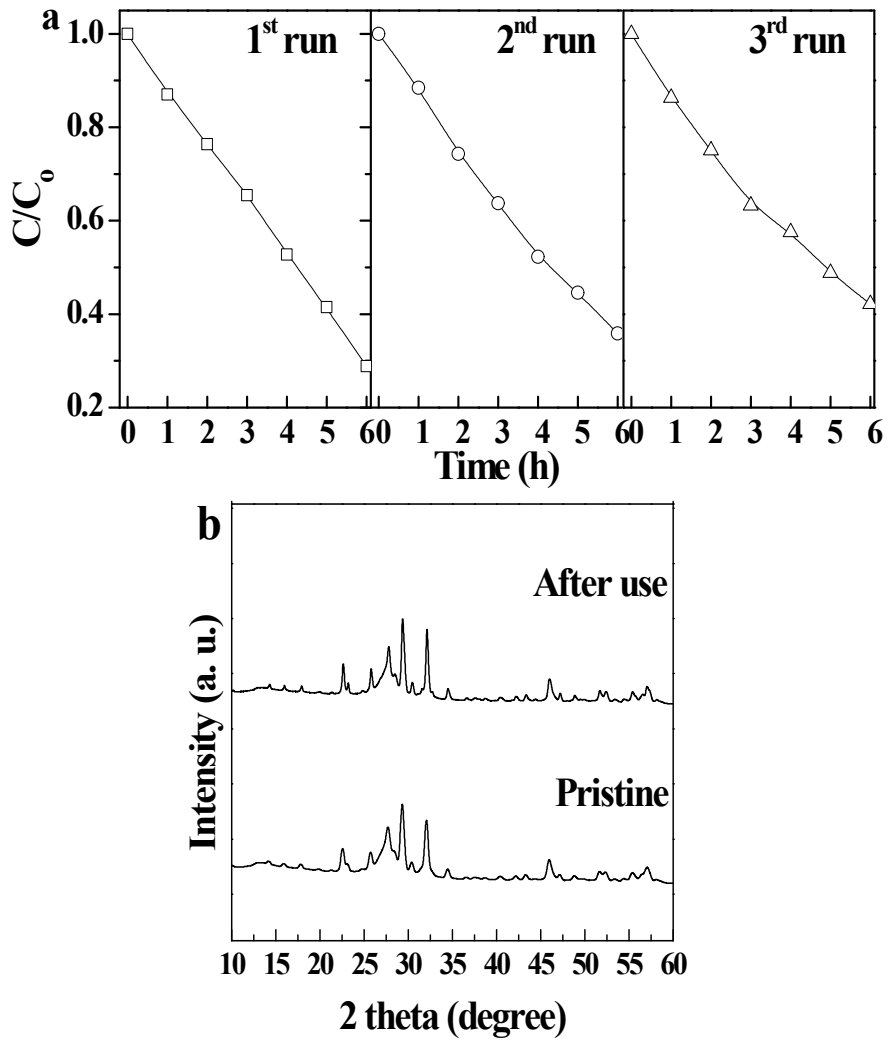


Figure S7. (a) Recyclability of 77CNNb nanocomposite photocatalyst over MB photodegradation and (b) their XRD patterns before and after use.

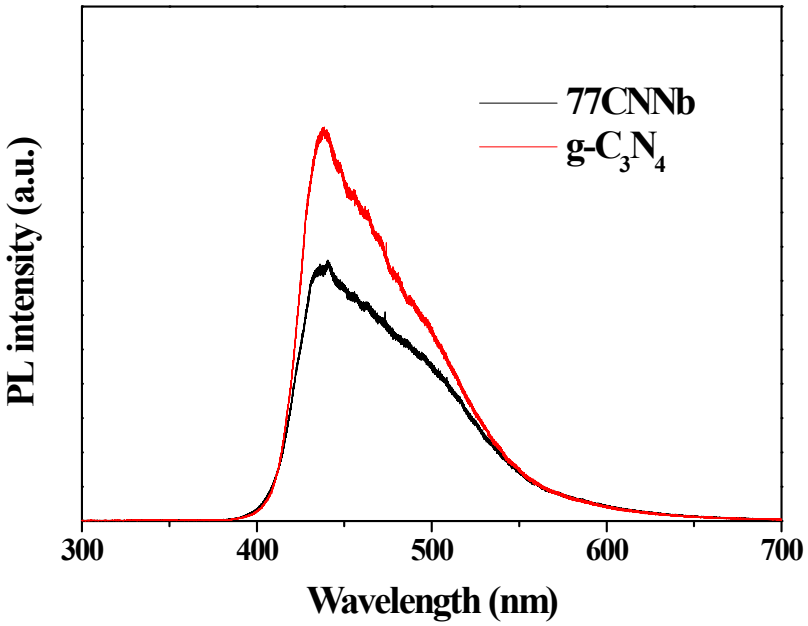


Figure S8. The PL spectra of pure g-C_3N_4 and 77CNNb nanocomposite samples excited by 325 nm laser.