Supporting Information

Promoting Magnesium Sulfite Oxidation by Partly Oxidized Metal Nanoparticles on Graphitic Carbon Nitride (g-C₃N₄) in the Magnesia Desulfurization Process

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Materials	Surface area(m ² /g)	Pore volume(cc/g)	Pore diameter(nm)	
g-C ₃ N ₄	19.65	0.092	4.04	
Co-C ₃ N ₄	19.99	0.114	4.04	

Table S1. Textural parameters of $g\text{-}C_3N_4$ and $Co\text{-}C_3N_4$

Samples	Fresh Co- C ₃ N ₄	(1)	(2)	(3)	(4)
Content of Co ²⁺	24.10%	15.38%	14.03%	14.02%	13.15%

Table S2. Content of Co^{2+} for recovered $Co-C_3N_4$ samples



Figure S1. SEM images of $g-C_3N_4$ and $Co-C_3N_4$, (a) $g-C_3N_4$, (b) $Co-C_3N_4$



Figure S2. TEM images of Co-C₃N₄



Figure S3. Tapping-mode AFM image (top) of $\text{Co-C}_3\text{N}_4$ and the corresponding height cross section profile of marked $\text{Co-C}_3\text{N}_4$. *Note:* Due to the limitation of the AFM instrument, the lateral size of the QDs is not the precise values, which were not shown here.^[1]



Figure S4. XRD pattern of M-C₃N₄ samples, (a) Ni(II)-C₃N₄; (b) Co(II)-C₃N₄; (c)

Cu(II)-C₃N₄; (d) Mn(II)-C₃N₄; Fe(II)-C₃N₄; Fe(III)-C₃N₄



Figure S5. Raman spectra of $g-C_3N_4$ and $Co-C_3N_4$



Figure S6. Co 2p XPS spectrum of revovered Co-C₃N₄ samples, (1) Co-C₃N₄ recovered for 1 time; (2) Co-C₃N₄ recovered after 2 times; (3) Co-C₃N₄ recovered after 3 times; (4) Co-C₃N₄ recovered after 4 times

References:

S1 M.-Y. Ye, Z.-H. Zhao, Z.-F. Hu, L.-Q. Liu, H.-M. Ji, Z.-R. Shen, T.-Y. Ma, *Angew. Chem. Int. Edit.* **2017**, *56*, 8407-8411.