

### Electronic supplementary Information

## Fabrication of novel ZnO/MMO/CNT nanohybrid derived from multi-cationic layered double hydroxide for photocatalytic degradation of azo dye under visible light

Fatemeh Khodam, Zolfaghar Rezvani\*, Ali Reza Amani-Ghadim

*Department of Chemistry, Faculty of Basic Sciences, Azarbaijan Shahid Madani University, Tabriz, Iran*

**Table S1. Elemental analyses of samples**

Sample	%Element				
	Co	Ni	Al	Zn	C
CoNiAl-LDH <sup>a</sup>	19.4	19.4	8.8	-	-
CoNiAl-LDH/CNT <sup>b</sup>	18.9	19.0	8.4	-	3.27
CoNiAl-LDH/CNT/ZnO <sup>c</sup>	13.7	13.6	5.9	21.81	2.65
MMO/CNT/ZnO <sup>d</sup>	17.8	17.7	8.0	27.5	3.42

<sup>a</sup> CoNiAl(OH)<sub>6</sub>(CO<sub>3</sub>)<sub>0.5</sub>.H<sub>2</sub>O , <sup>b</sup> CoNiAl(OH)<sub>6</sub>(CO<sub>3</sub>)<sub>0.5</sub>.H<sub>2</sub>O]/CNT

<sup>c</sup> [CoNiAl(OH)<sub>6</sub>(CO<sub>3</sub>)<sub>0.5</sub>.H<sub>2</sub>O]/CNT/ZnO , <sup>d</sup> MMO/CNT/ZnO

Percentages of Co, Ni, Al and Zn have been determined by ICP and C by CHNSO analyzer. By dividing the measured percentage to the atomic mass of appropriate element, the mole content of elements in the each sample has been determined. Water content of LDHs obtained via TGA thermograms. Then, the molar ratios of elements have been determined as tabulated in **Table S2**. The analytical results confirm that the [M]/[M'] molar ratios are comparative to that in the initial solution.

\* Corresponding author: zrezvani@azaruniv.ac.ir, or [z\\_rezvani@yahoo.com](mailto:z_rezvani@yahoo.com), Phone & Fax: +98 41 34 32 75 41

**Table S2. Theoretical and measured mole ratios of metals**

Sample	Mole Ratios: Theoretical <sup>a</sup> (Found)					
	Co:Ni	Co:Al	Co:Zn	Ni:Al	Ni:Zn	Al:Zn
CoNiAl-LDH	1.0(0.99)	1.0(1.00)	-	1.0(1.02)	-	-
CoNiAl-LDH/CNT	1.0(0.99)	1.0(1.03)	-	1.0(1.04)		
CoNiAl-LDH/CNT/ZnO	1.0(1.00)	1.0(1.06)	0.66(0.69)	1.0(1.06)	0.66(0.69)	0.66(0.66)
MMO/CNT/ZnO	1.0(1.00)	1.0(1.02)	0.66(0.72)	1.0(1.02)	0.66(0.72)	0.66(0.71)

<sup>a</sup> Based on initial concentration in solution