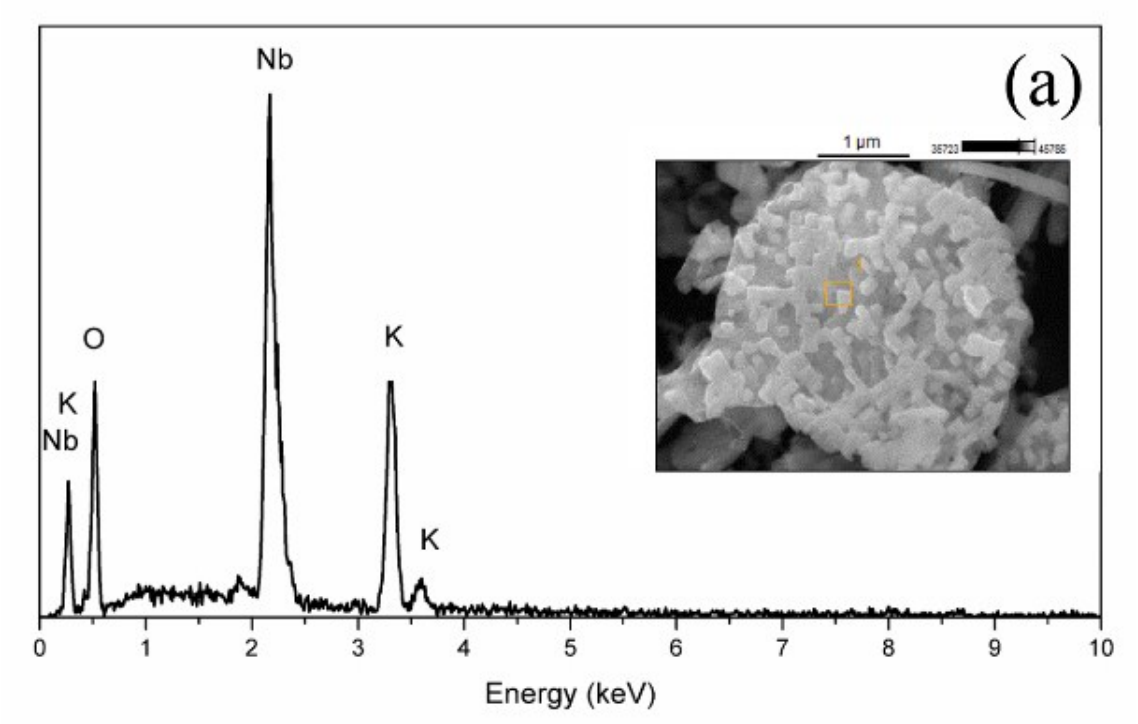
Electronic Supplementary Information

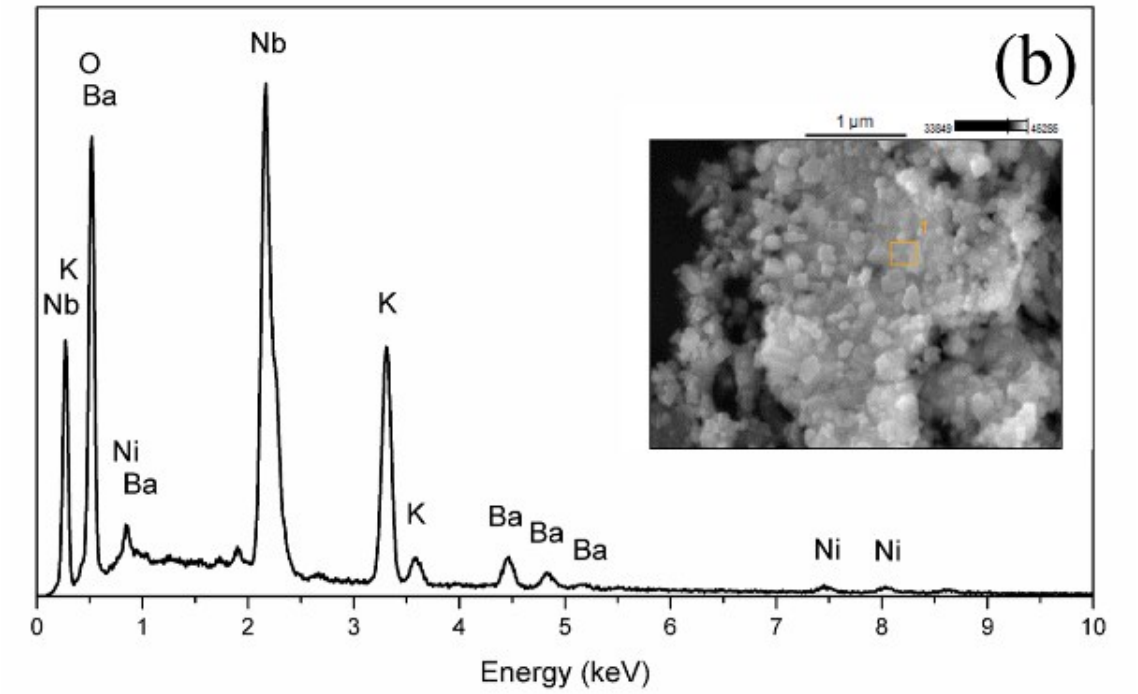
Enhanced visible light absorption and photocatalytic activity of $[KNbO_3]_{1-x}[BaNi_{0.5}Nb_{0.5}O_{3-\delta}]_x$ synthesized by sol-gel based Pechini method

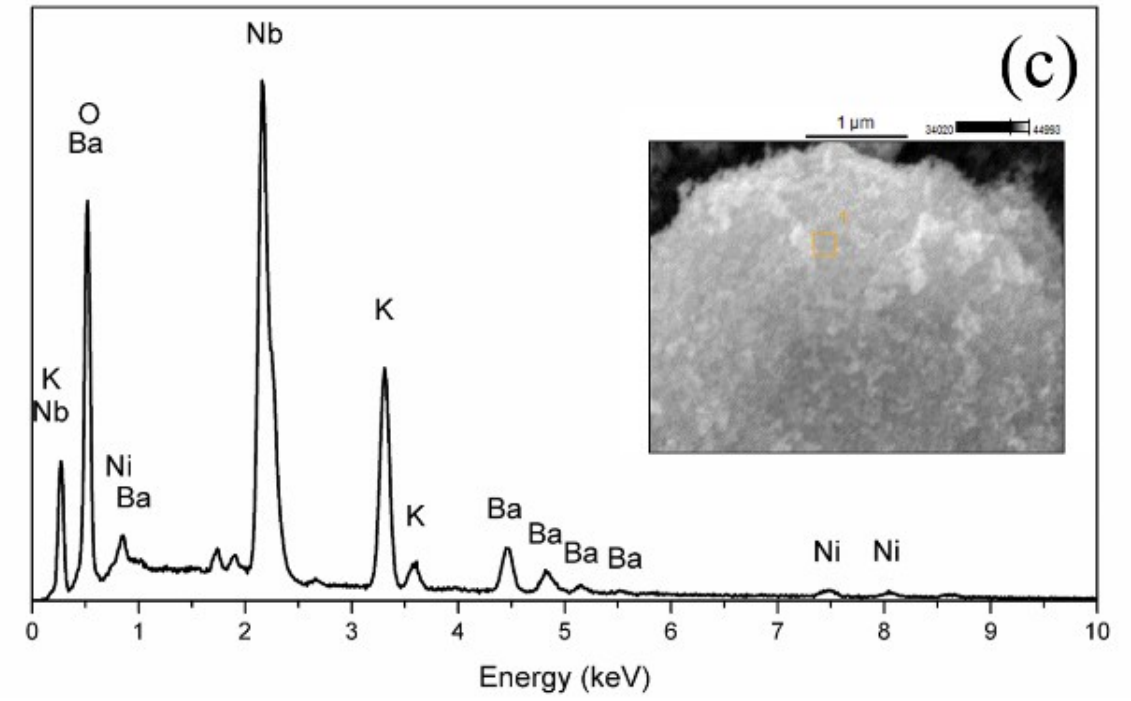
Ping Wu, Guoming Wang, Ruizhi Chen, Yixin Guo, Xueming Ma* and Dongmei Jiang

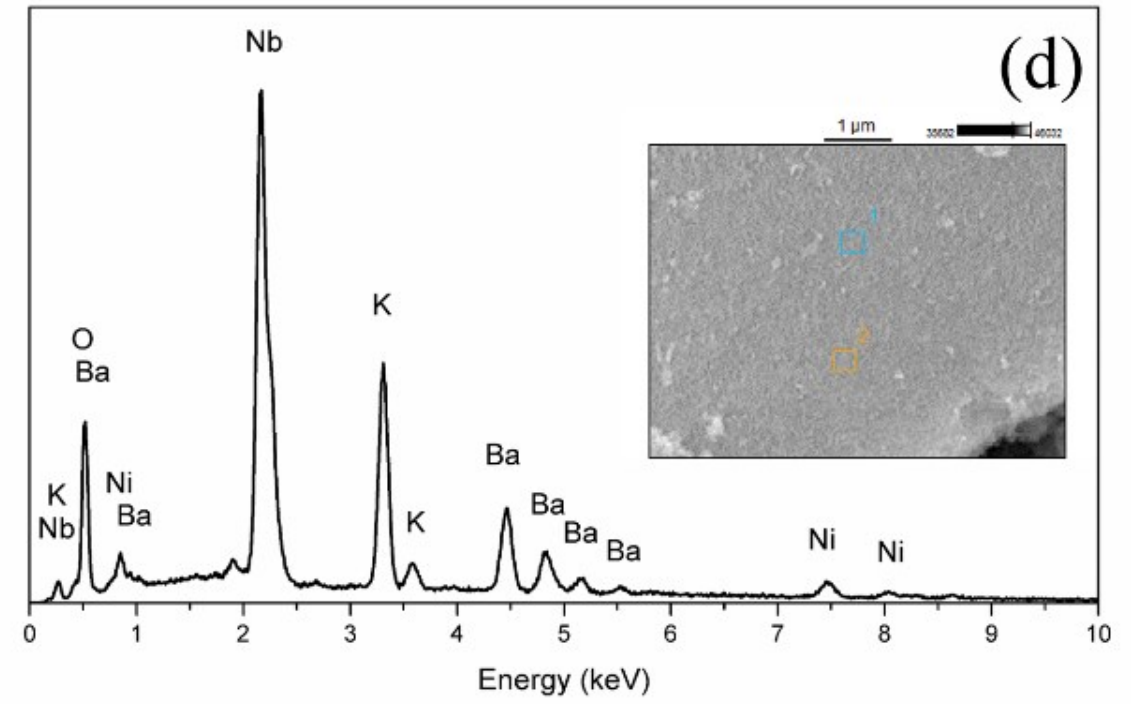
School of Physics and Material Science, East China Normal University, Shanghai 200241, People's Republic of China

1. EDX spectra and EDX elemental mapping data of KBNNO samples with various x values, measured by a JEOL JSM 7800F field emission scanning electron microscope.






(c)
Nb
O
Ba
K
Nb
Ni
Ba
K
Ba
Ba
Ba
Ba
Ni
Ni
1 µm
0
1
2
3
4
5
6
7
8
9
10
Energy (keV)


(d)
Nb
O
Ba
K
Nb
Ni
Ba
K
Ba
Ba
Ba
Ba
Ni
Ni
1 µm
0
1
2
3
4
5
6
7
8
9
10
Energy (keV)

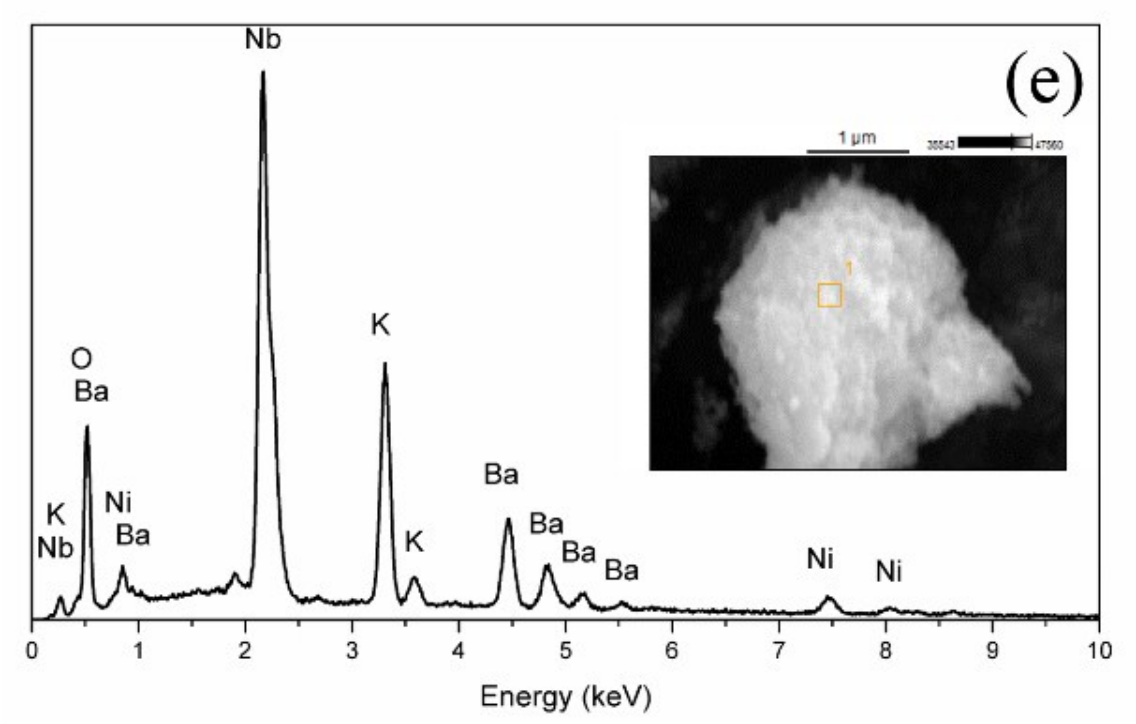
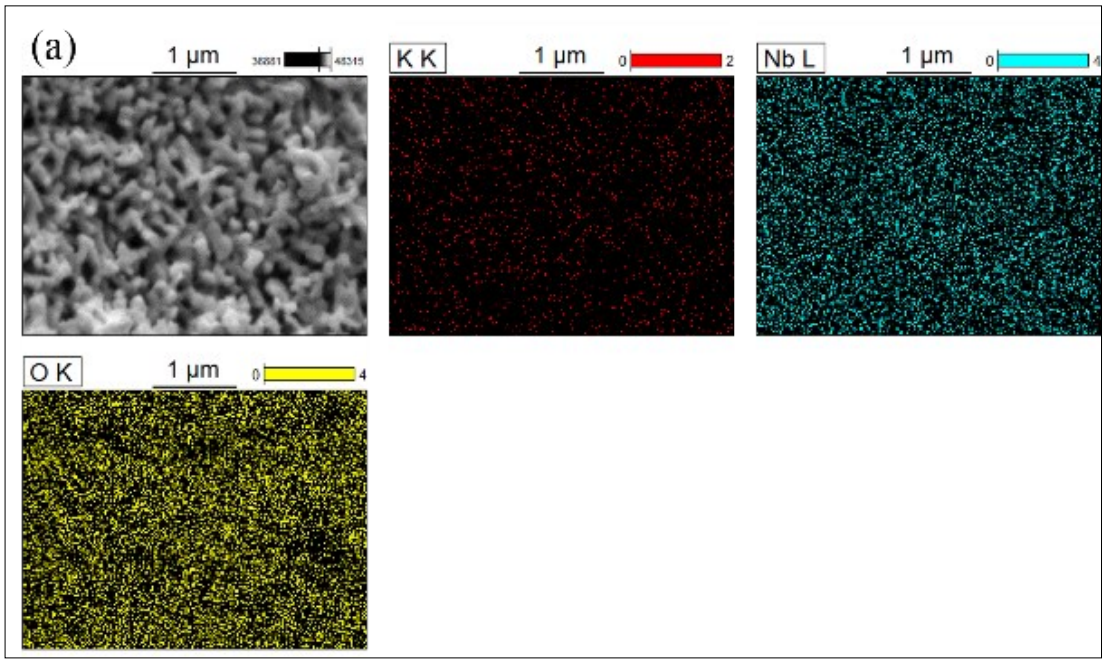
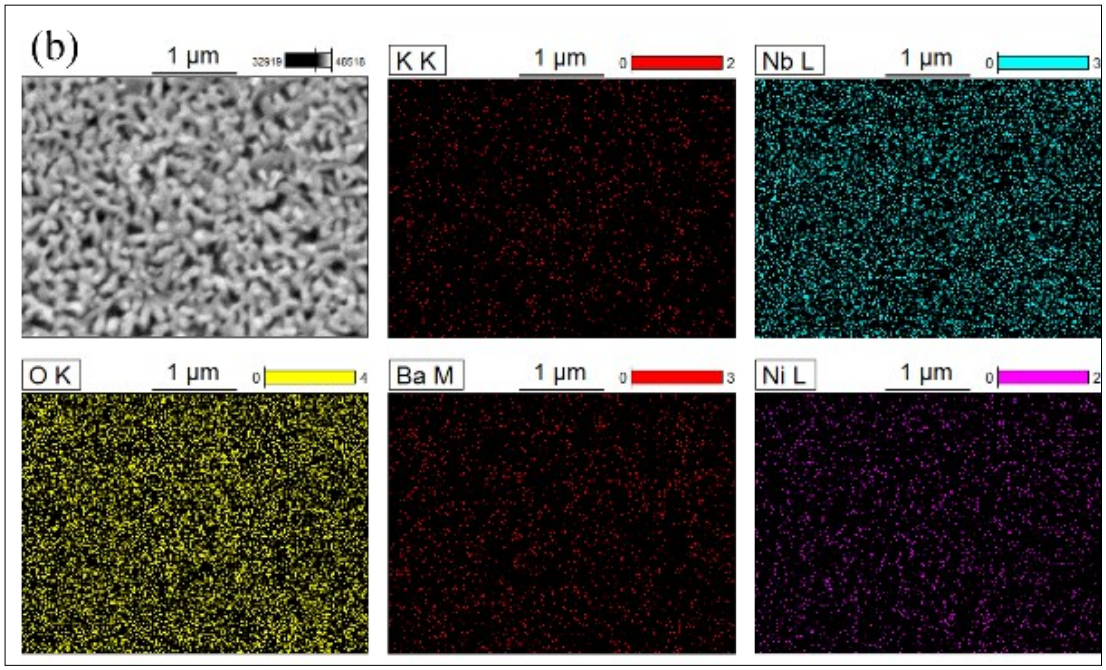
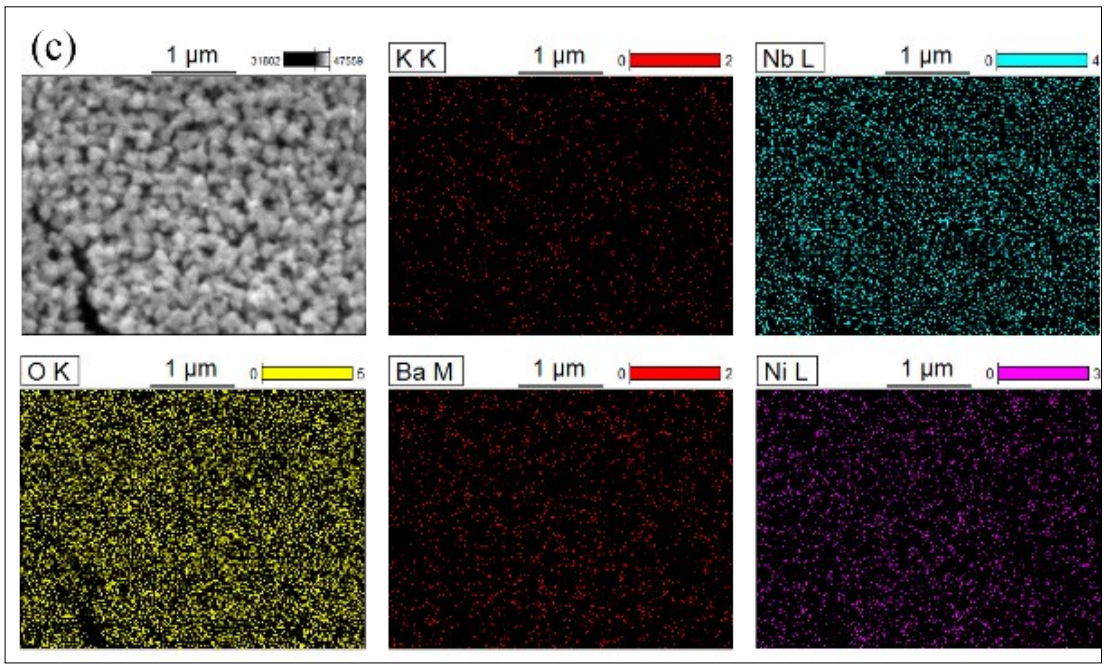
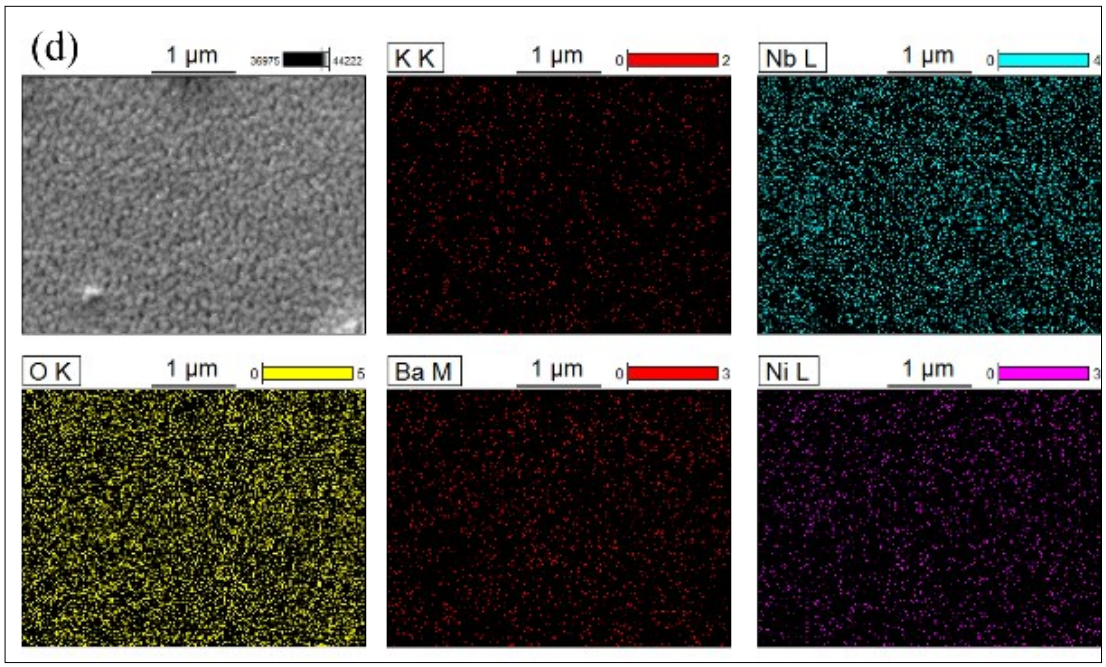


Fig. S1. SEM image and the corresponding EDX spectra of $KNbO_3$ (a), KBNNO samples (b), (c), (d) and (e) with different x value (x=0.1-0.4)


(a)
1 μm
K K
1 μm
Nb L
1 μm
O K
1 μm


(b)
1 μm
K K
1 μm
Nb L
1 μm
O K
1 μm
Ba M
1 μm
Ni L
1 μm


(c)
1 µm
31602
47558
K K
1 µm
0
2
Nb L
1 µm
0
4
O K
1 µm
0
5
Ba M
1 µm
0
2
Ni L
1 µm
0
3


(d)
1 µm
36976
44222
K K
1 µm
0
2
Nb L
1 µm
0
4
O K
1 µm
0
5
Ba M
1 µm
0
3
Ni L
1 µm
0
3

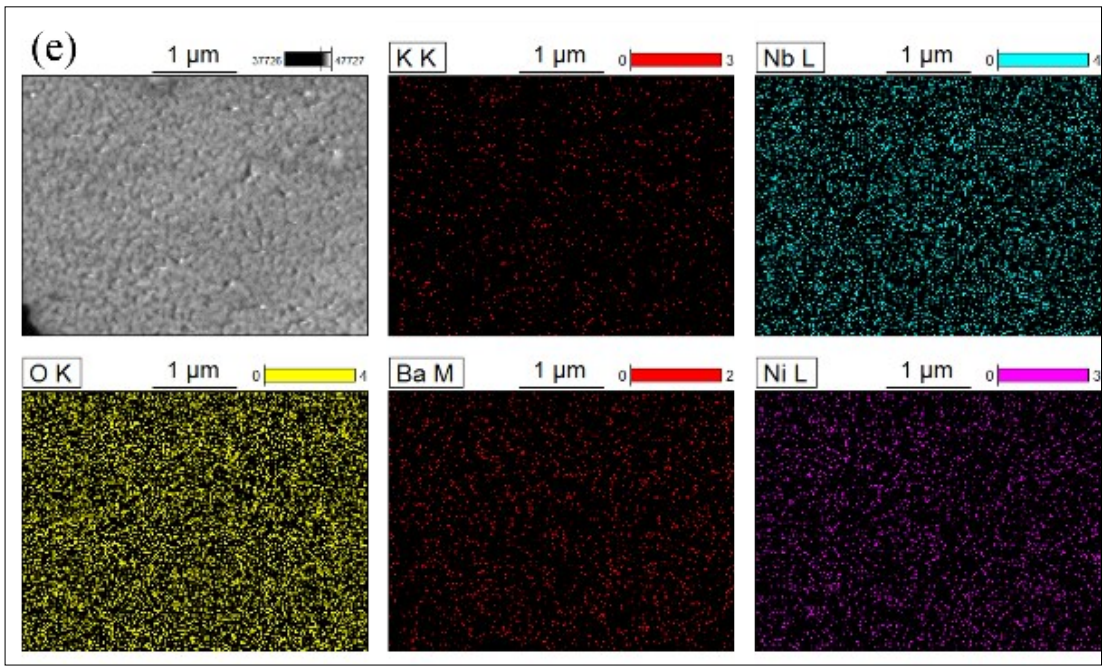


Fig. S2. SEM image and the corresponding EDX mapping results of $KNbO_3$ (a), KBNNO samples (b), (c), (d) and (e) with different x value (x=0.1-0.4)

Table S1. K, Nb, Ba and Ni content in KBNNO obtained from EDX spectra

Sample	K (Atom %)	Nb (Atom %)	Ba (Atom %)	Ni (Atom %)
x=0	17.43±0.56	18.61±0.34	-	-
x=0.1	9.75±0.09	11.55±0.08	1.64±0.06	0.82±0.15
x=0.2	9.75±0.08	13.13±0.08	2.63±0.06	1.14±0.14
x=0.3	14.52±0.14	20.25±0.14	7.39±0.13	3.87±0.29
x=0.4	7.05±0.08	11.38±0.08	5.70±0.08	2.75±0.17

2. Nitrogen adsorption/desorption isotherms of KBNNO samples with different x values

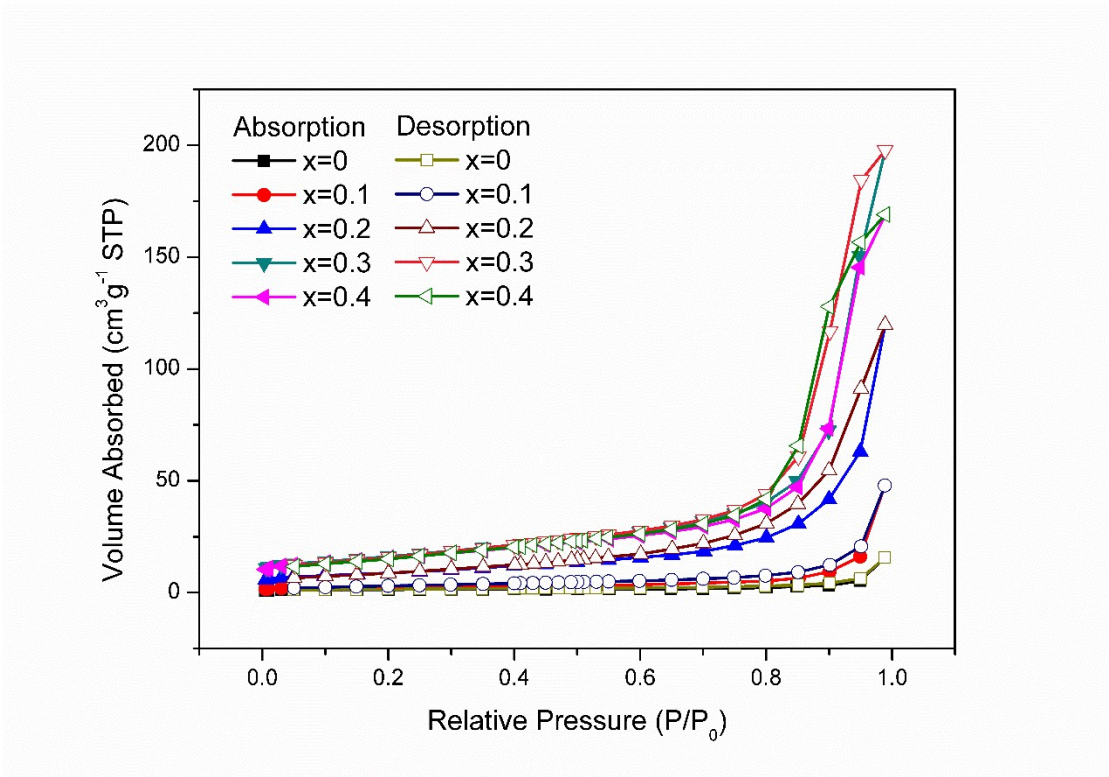


Fig. S3 Nitrogen adsorption/desorption isotherms of KBNNO samples with different x values

3. Degradation kinetics

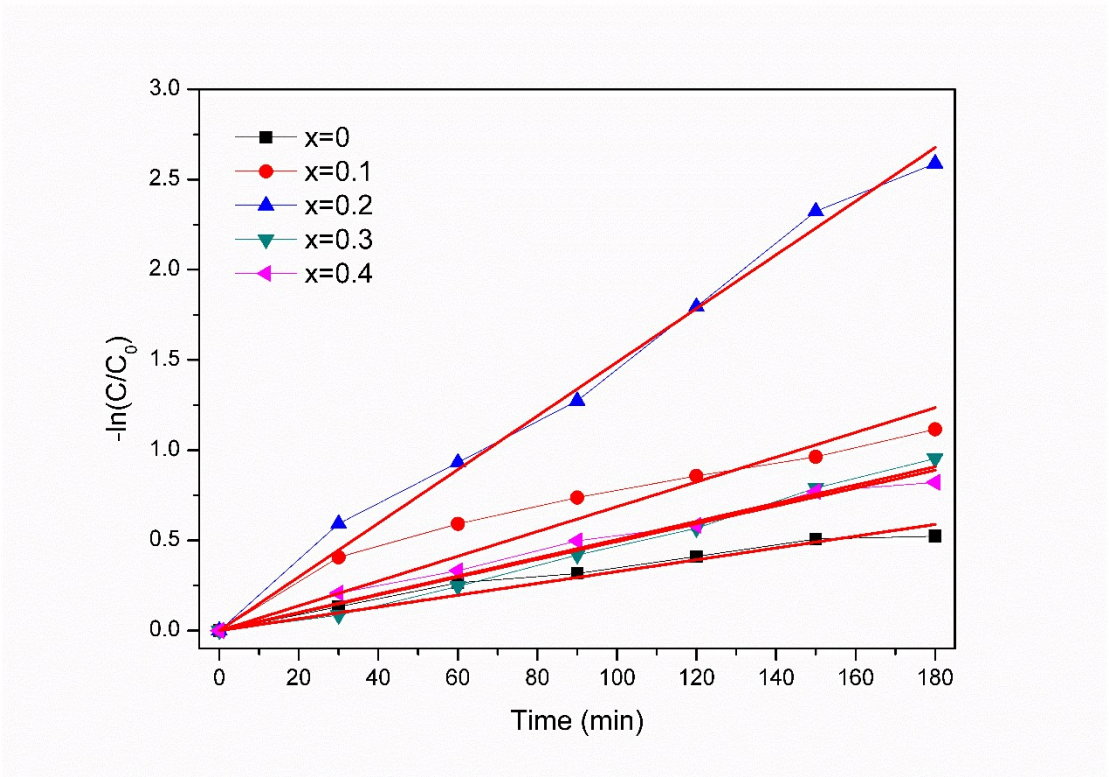


Fig. S4 Kinetic plot for linear fitting of data obtained from pseudo-first order reaction of all samples for the degradation of methylene blue under visible light irradiation for 180 min.