Supporting Information

The magnetic and adsorption properties of $ZnO_{1-x}S_x$

nanoparticles

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Fig. S1



Fig. S1 The dependence of (100) diffraction peak position and E_g on sulfur concentration.





Fig. S2 The SEM images of ZnO, $ZnO_{0.95}S_{0.05}$, $ZnO_{0.9}S_{0.1}$, $ZnO_{0.8}S_{0.2}$, respectively.

	Element	Atomic percentage				Element	Atomic percentage	
. 0 20	O K S K Zn L Total amour	58.44 1.96 39.6 at 100.00	ZnO	_{0.95} S _{0.05}	¢ 0 0	O K S K Zn L Total amour	50.15 4.90 44.95 nt 100.00	ZnO _{0.9} S _{0.1}
1 2	3 4	5 6	7 8	9 10 keV	0 2	4 6	8 10 12	14 16 18 20 ke
Ś	Element	Atomic percentage			a	Element	Atomic percentag	ge .
0 6	C K O K S K Zn L Au M Total amount	14.41 41.76 5.49 36.34 2.00 100.00	ZnO _{0.8}	₅ S _{0.15}	0 	C K O K S K Zn L Total amo	11.34 41.45 7.59 39.62 unt 100.00	ZnO _{0.8} S _{0.2}
0 2 4	6 8	10 12	14 16	18 20 keV	0 2 p	4 6	8 10 12	14 16 18 2/ ke

Fig. S3

Fig. S3 the EDX pattern of Zinc oxysulfide nanoparticles. It should be noted that O

concentration cannot be determined accurately. Thus, we determined the S concentration from Zn.



Fig S 4

Fig. S4 The Lorentzian fitting of the emission peak of S doped ZnO.

Table S1	The	location	and	area	of	peak	A	and	peak	В	obtained	by	the	fitting	resu	lts
shown in	Fig.	S4.														

	Peak A	(Zn_i)	Peak B (V _{Zn})			
	Location	(area)	Location	(area)		
	(nm)		(nm)			
ZnO _{0.95} S _{0.05}	440	121791	479	739895		
ZnO _{0.9} S _{0.1}	435	500321	473	1159060		
ZnO _{0.85} S _{0.15}	433	66881	484	1414760		
ZnO _{0.8} S _{0.2}	438	88581	471	357047		