

Supplementary Information

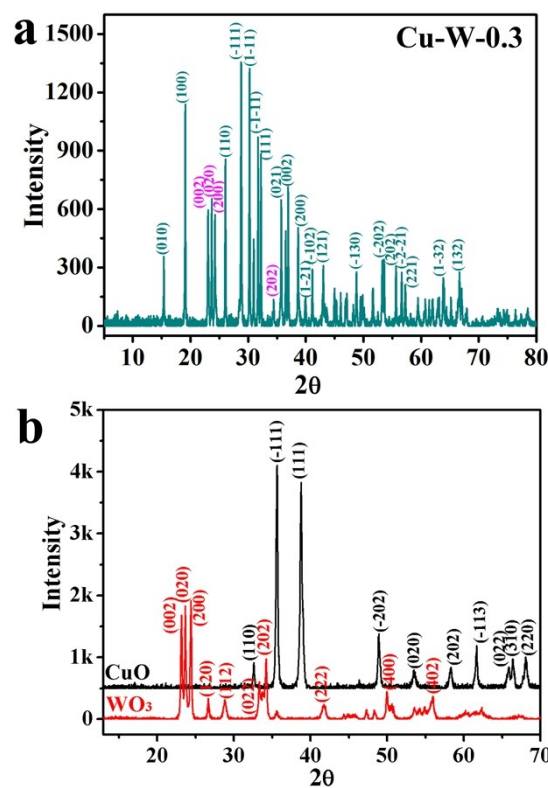


Figure S1. XRD patterns of (a) Cu-W-0.3; (b) pure CuO and WO₃ calcinated at 600 °C.

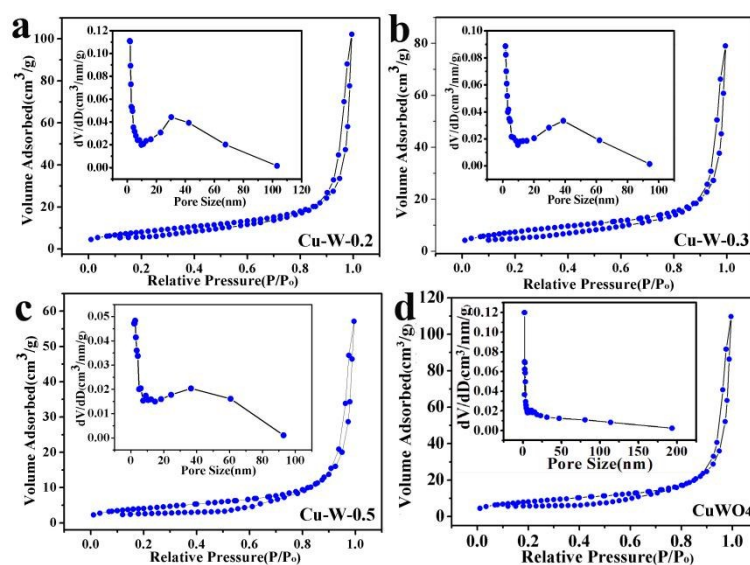


Figure S2 N₂ adsorption-desorption isotherms and pore-size-distribution curve of (a) Cu-W-0.2, (b) Cu-W-0.3, (c)

Cu-W-0.5 and (d) CuWO_4 .

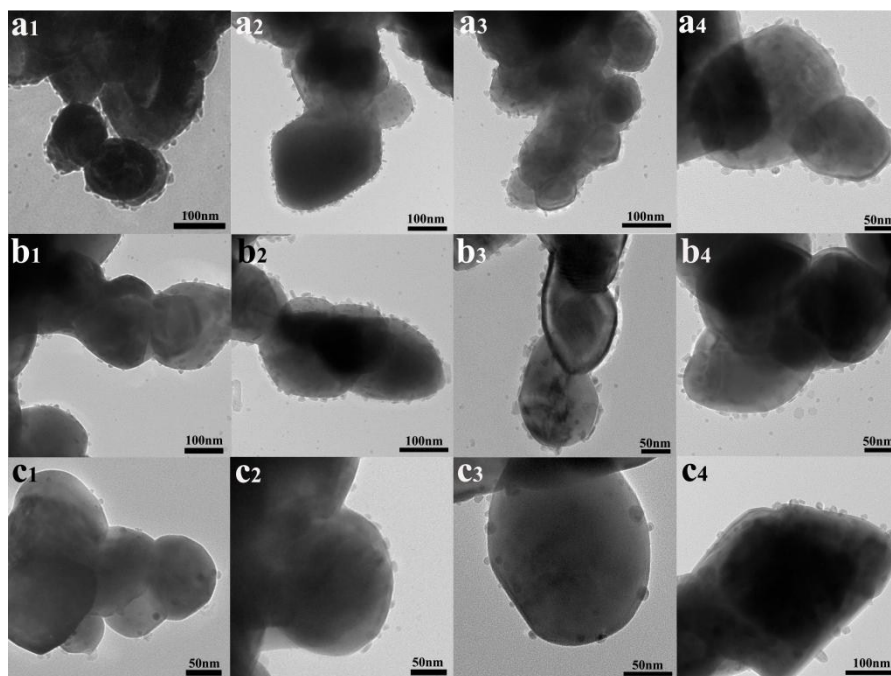


Figure S3. TEM images of (a₁-a₄) Cu-W-0.2; (b₁-b₄) Cu-W-0.3; (c₁-c₄) Cu-W-0.5

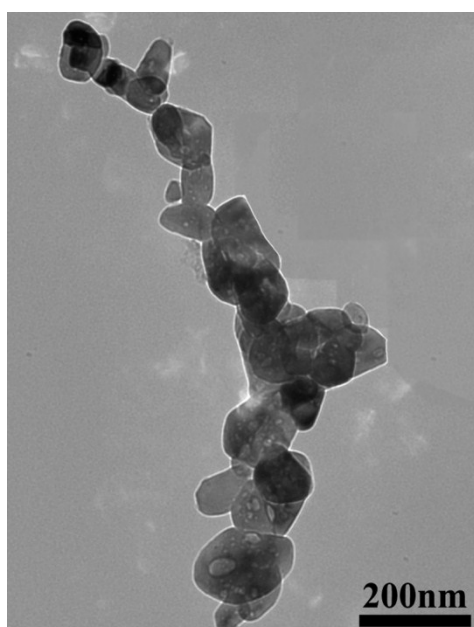


Figure S4. The enlarged image of Figure 6a.

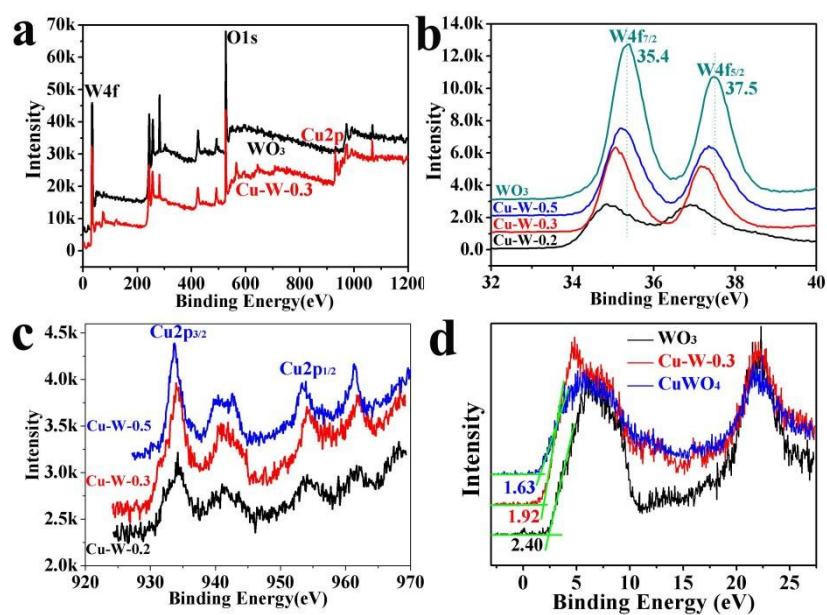


Figure S5. XPS spectra of the samples. (a) survey; (b) W 4f; (c) Cu 2p; (d) valence band spectrum.

Table S1. O 1s peak position and peak area ratio of the four samples.

Sample	WO ₃			Cu-W-0.2			Cu-W-0.3			Cu-W-0.5		
Peak	O ₁	O ₂		O ₁	O ₂	O ₃	O ₁	O ₂	O ₃	O ₁	O ₂	O ₃
Peak position(eV)	529.9	531.0		529.9	531.0	532.0	530.0	531.0	532.0	530.0	531.0	532.0
Peak area ratio(%)	71.9	28.1		74.4	17.4	8.2	62.9	15.5	21.6	80.3	12.4	7.3

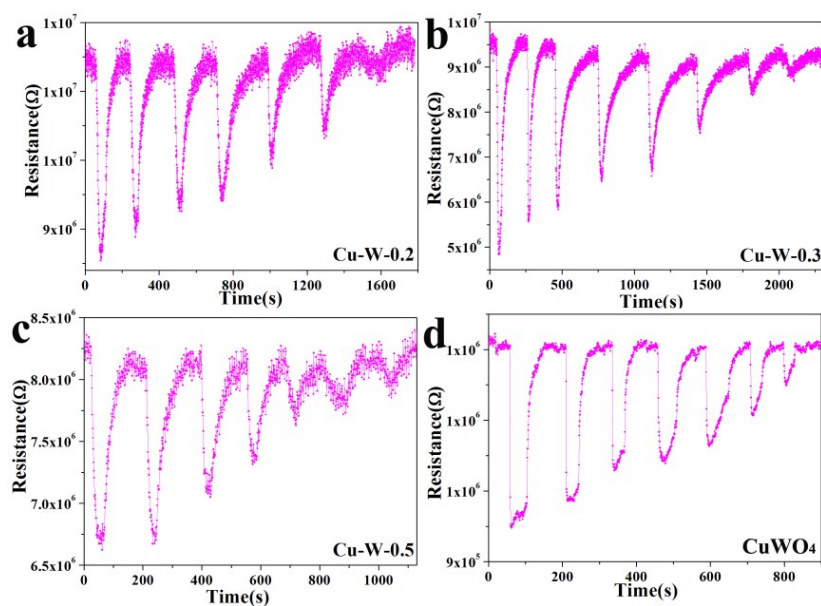


Figure S6. Dynamic response-recovery curves of the four samples.

Table S2. The response and response time of the four samples to different CO concentrations.

Samples	ppm	1000	500	300	100	50	30	10	5
Pure WO ₃	Res.(%)	-	-	-	-	-	-	-	-
	Time(s)	-	-	-	-	-	-	-	-
Pure CuO	Res.(%)	-	-	-	-	-	-	-	-
	Time(s)	-	-	-	-	-	-	-	-
Cu-W-0.2	Res.(%)	24.2	20.4	17.3	16.5	11.9	7.3	1.7	-
	Time(s)	17.0	19.3	20.6	22.3	21.0	24.7	26.3	-
Cu-W-0.3	Res.(%)	54.2	48.7	46.3	34.0	28.2	19.0	7.1	2.8
	Time(s)	10.7	12.0	12.0	12.7	11.2	12.6	13.7	17.0
Cu-W-0.5	Res.(%)	26.5	25.4	21.3	14.2	10.0	6.1	3.8	-
	Time(s)	4.6	4.0	5.3	9.0	11.3	12.7	10.0	-
CuWO ₄	Res.(%)	18.2	15.2	13.6	9.3	9.8	5.5	2.0	-

Time(s)	1.0	1.0	1.7	2.0	2.1	3.2	3.7	-
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Table S3. The response and response time of Cu-W-0.3 sensor to six same CO concentrations cycles.

Con.(CO gas)	Cycle number	1	2	3	4	5	6
1000ppm	Response(%)	53.5	51.9	52.6	53.0	52.2	53.1
	Response time(s)	8.0	8.2	7.7	8.4	8.2	8.8
100ppm	Response(%)	33.3	34.0	33.5	33.7	31.0	30.8
	Response time(s)	10.0	10.8	10.5	10.2	10.5	11.0
10ppm	Response(%)	8.2	7.9	8.1	8.1	8.1	8.4
	Response time(s)	12.0	11.9	11.5	12.2	11.8	12.5