

Supporting Information

Table S1 α/β phase ratio depending on the XRD patterns in Fig. 1a,b.

	$x = 0$	$x = 0.005$	$x = 0.01$	$x = 0.02$	$x = 0.03$	$x = 0.05$	$x = 0.07$	$x = 0.09$
α/β phase ratio	1:0	1.7:1	1.8:1	1.8:1	1.2:1	0.9:1	0.4:1	0.6:1

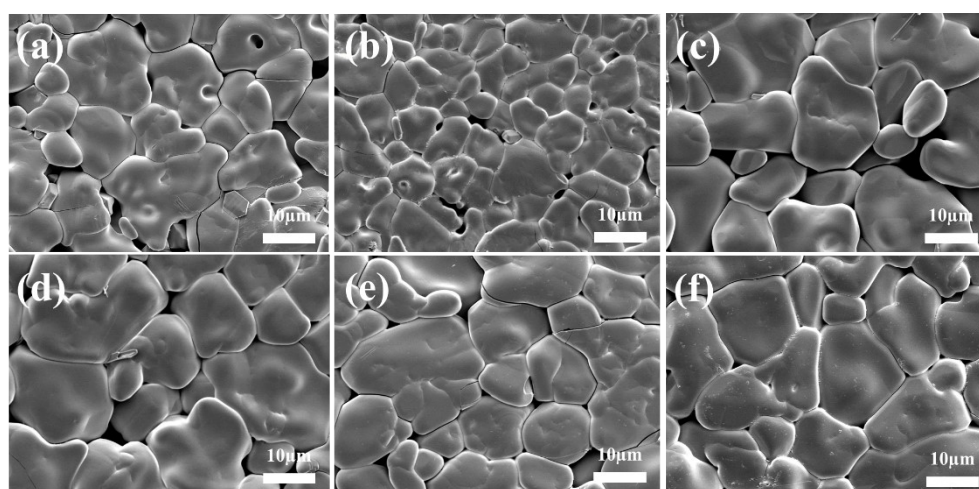


Fig. S1. SEM images of α - $\text{Cu}_{2-x}\text{Li}_x\text{V}_2\text{O}_7$ with $x = 0$ (a), 0.01 (b), 0.03 (c), 0.05 (d), 0.07 (e), 0.09 (f).

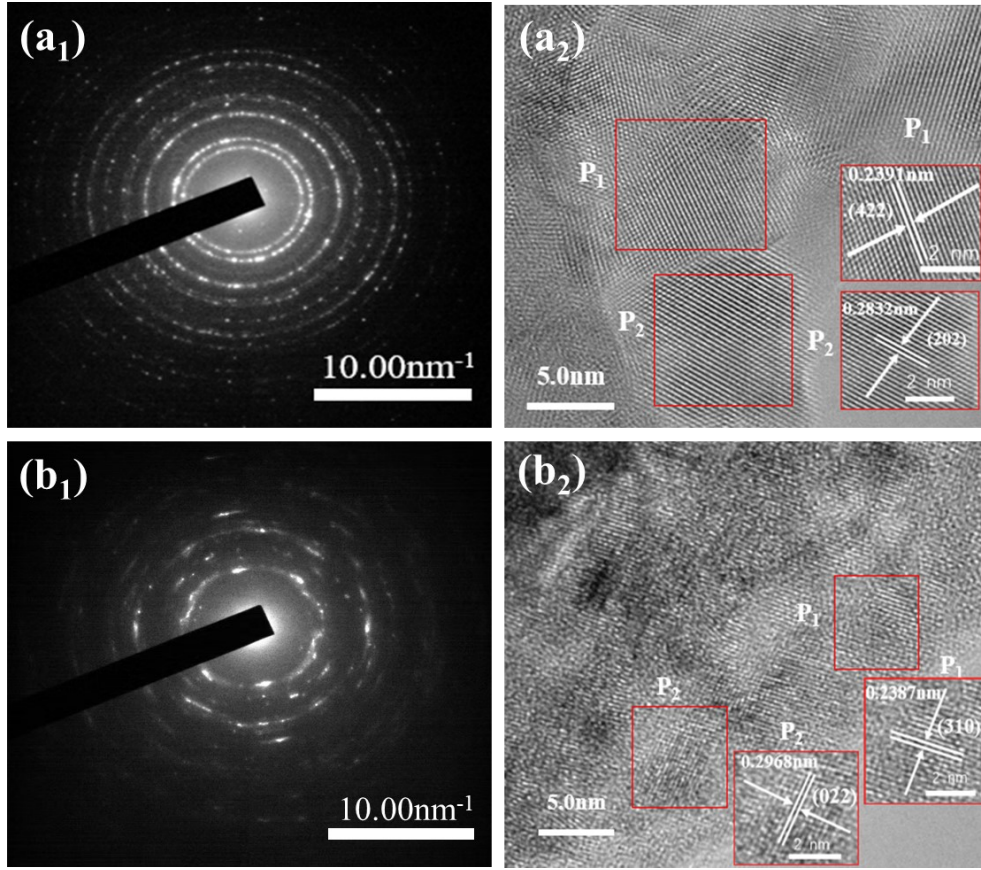
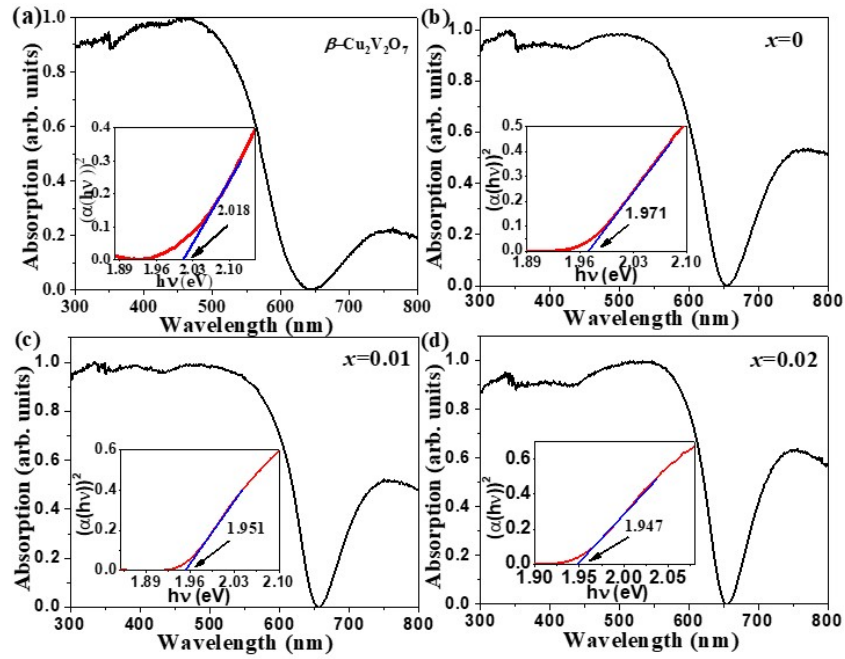


Fig. S2. SAED patterns: electron diffraction spots and lattice fringes of α - $\text{Cu}_{2-x}\text{Li}_x\text{V}_2\text{O}_7$ with $x = 0$ (a_1, a_2), 0.07 (b_1, b_2).



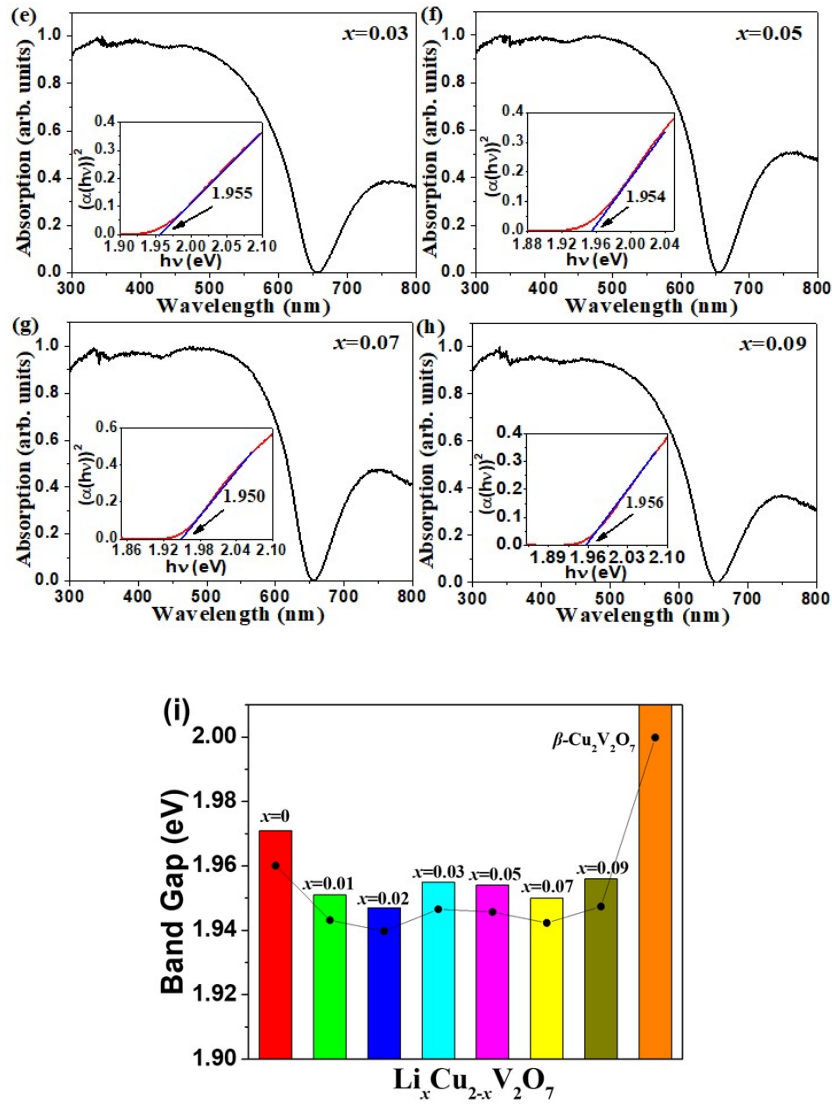


Fig. S3. (a-h) UV-absorption spectra of β - $\text{Cu}_2\text{V}_2\text{O}_7$ and Li-doped α - $\text{Cu}_2\text{V}_2\text{O}_7$. The inset exhibits that estimated band gaps (E_g) through absorption spectra. (i) Band gap change with Li content.

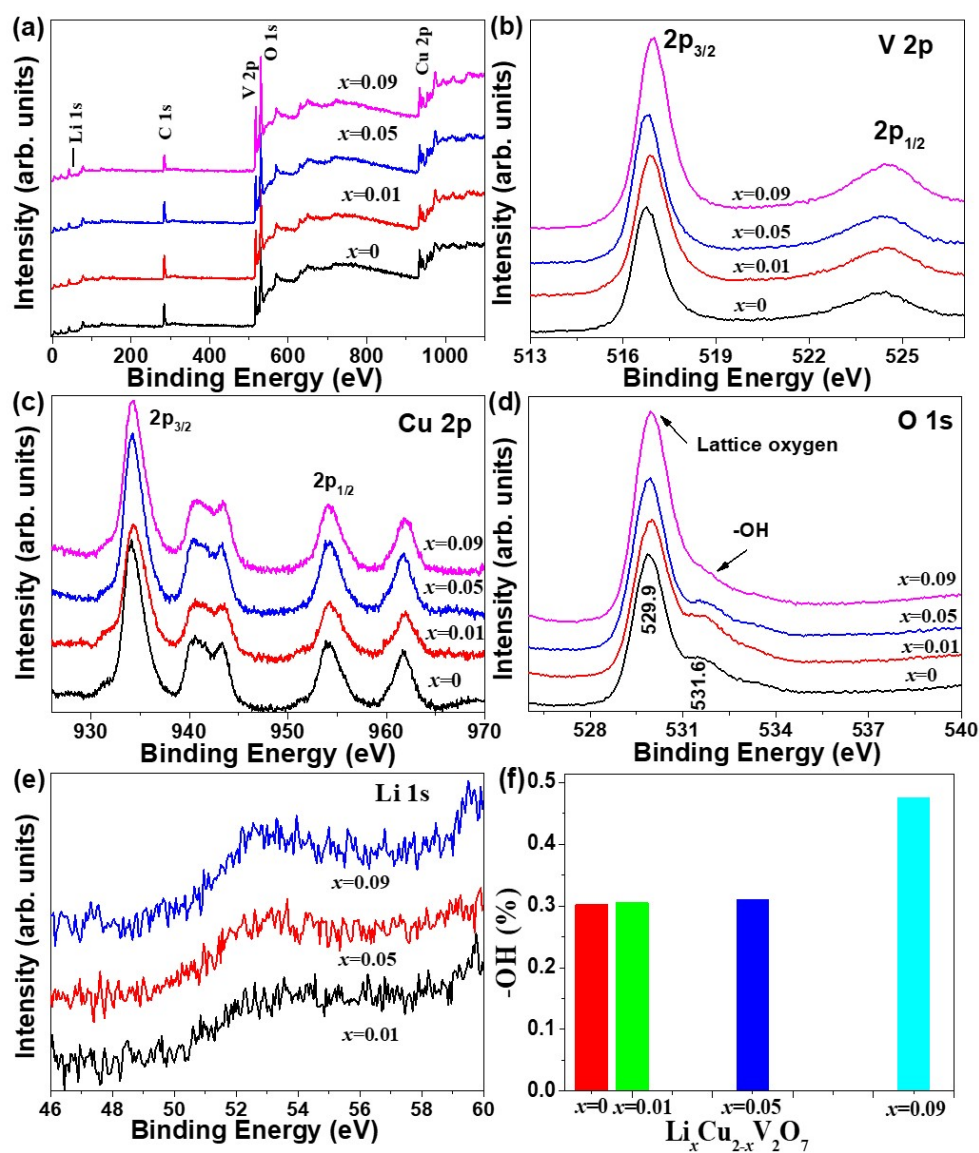


Fig. S4. XPS survey spectra, core level spectra, and adsorptive -OH concentration of

