

Supporting information for

## **Controllable synthesis of “L”-shaped V<sub>2</sub>O<sub>5</sub> and the improved adsorption capacity by fluorine**

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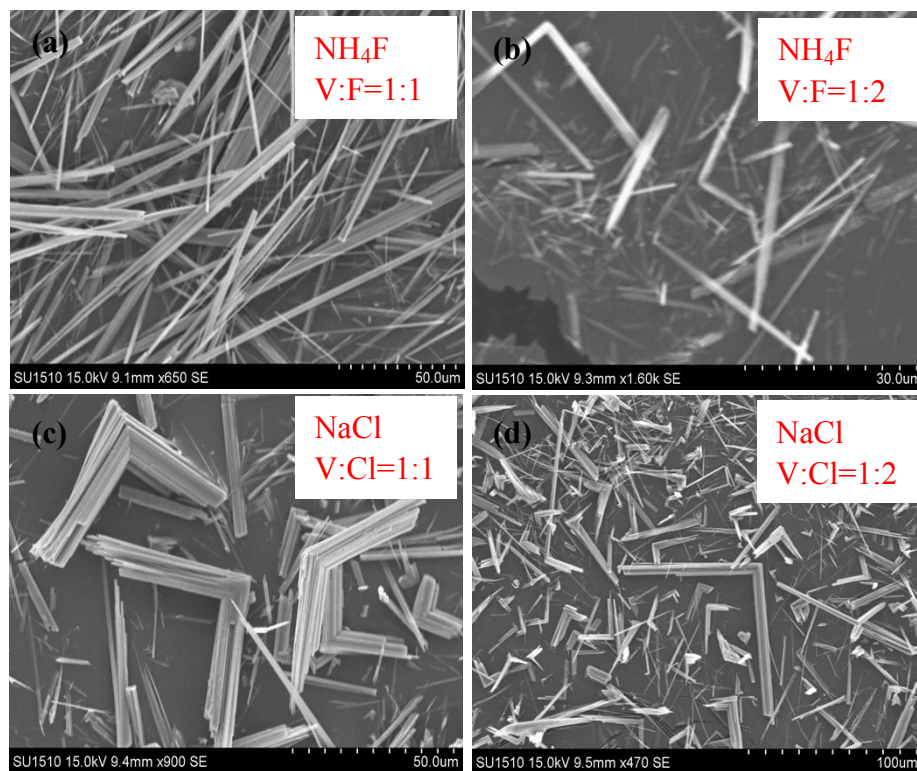
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**Table S1.** Atomic concentration (*at%*)

<b>Atomic species</b>	<b>C 1s</b>	<b>O 1s</b>	<b>V2p</b>	<b>F 1s</b>
<b>F1</b>	84.99	2.77	10.53	1.71
<b>F2</b>	74.78	19.31	4.49	1.42
<b>F3</b>	60.74	29.35	8.22	1.69

**Fig. S1**



**Fig. S1** Effects of  $NH_4F$  and  $NaCl$  on the morphology of  $V_2O_5$ .

Fig. S2

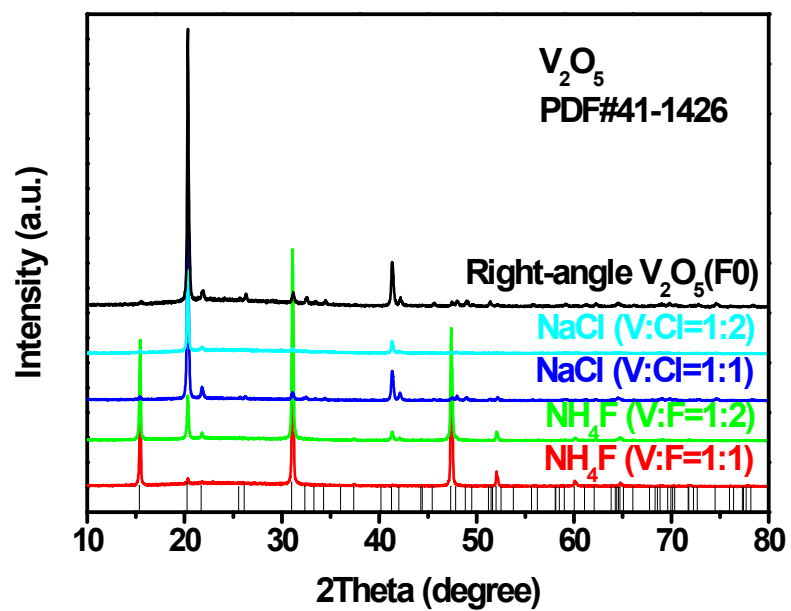


Fig. S2 The XRD patterns of  $V_2O_5$  samples synthesized in different system.

Fig. S3

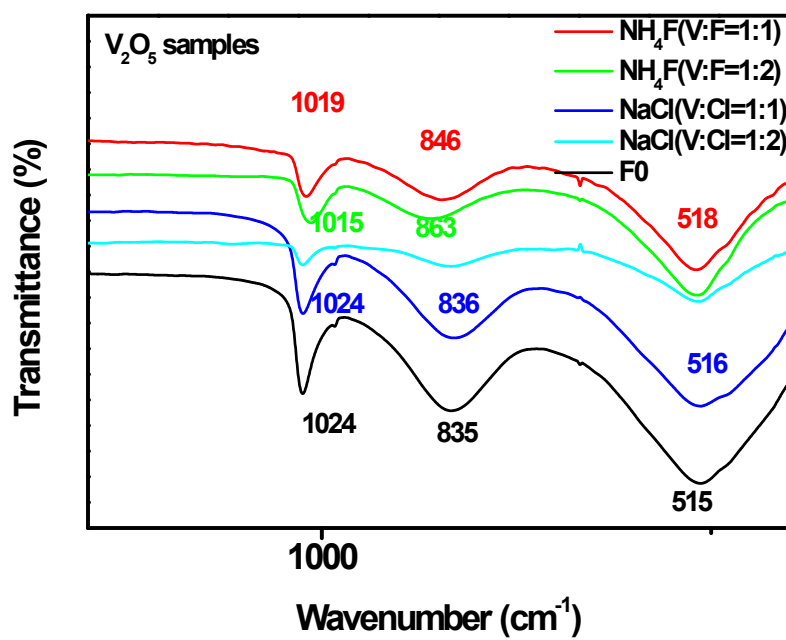


Fig. S3 FT-IR spectrum of V<sub>2</sub>O<sub>5</sub> samples in different systems.

Fig. S4

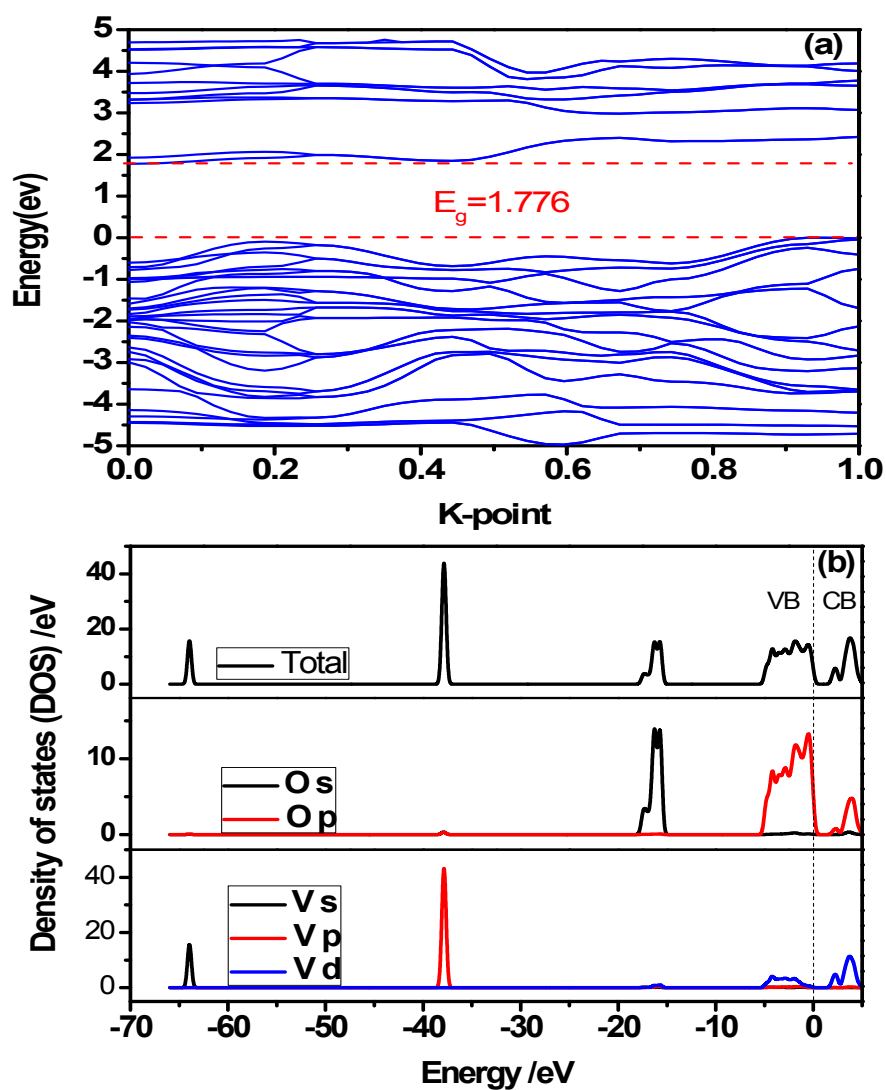


Fig. S4 Band structure and density of states for pure  $V_2O_5$ : (a) band structure, (b) DOS.

From Fig. S4b, we can see that for  $V_2O_5$ , the top edge of valence band (VB) is attributed to the O 2p and the partial V 3d orbitals, and the bottom edge of conduction band (CB) is attributed to the V 3d and the partial O 2p orbitals.