Electronic Supplementary Material (ESI) for Inorganic Chemistry Frontiers.

Supplementary Information

2D ternary vanadium phosphorous chalcogenide with strong in-plane optical anisotropy

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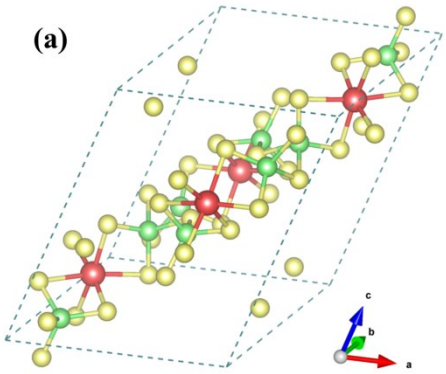


(b)

Parameters	Distance/Angle
a	0.9112 nm
b	0.9680 nm
c	1.1620 nm
α	72.15°
β	110.82°
γ	110.13°

Fig. S1 (a) The unit cell structure of triclinic $V_2P_4S_{13}$. (b) Lattice parameters of $V_2P_4S_{13}$.

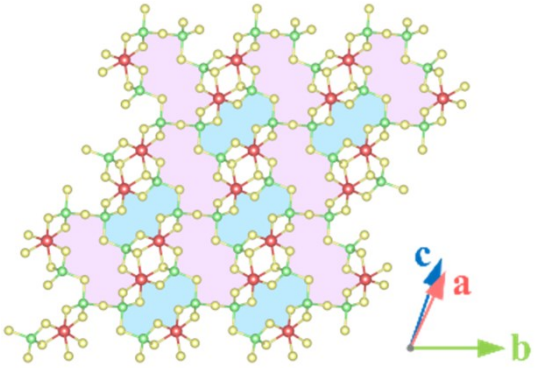


Fig. S2 Top view of distinctive porous 2D $V_2P_4S_{13}$ with anisotropic distribution of angstrom-scale pores indicated by different fill colors.

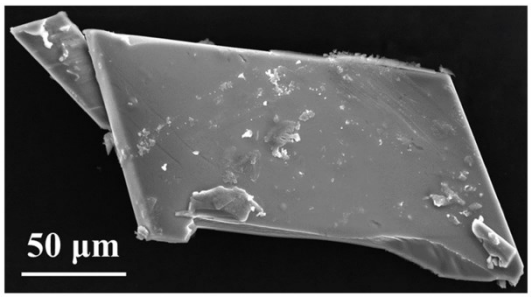
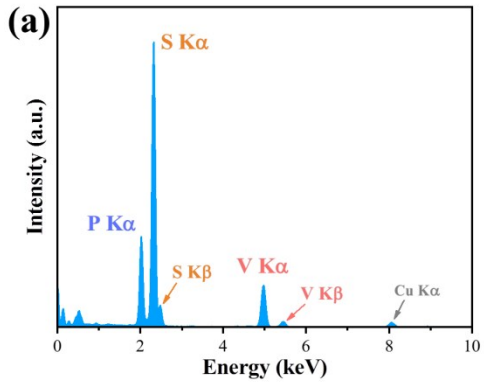


Fig. S3 Scanning electron microscope image of single crystal $V_2P_4S_{13}$.



(b)

Element	Stoichiometric ratio	EDS analysis result %
V	2	9.36
P	4	22.15
S	13	68.49

Fig. S4 (a) Energy dispersive spectrum of $V_2P_4S_{13}$ nanosheet on Cu grid. (b) Quantitative analysis results of energy dispersive spectrum of $V_2P_4S_{13}$ nanosheet.

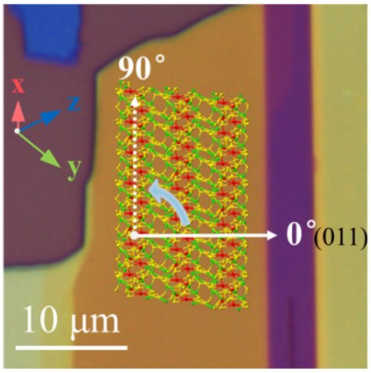
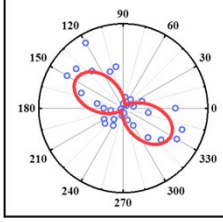
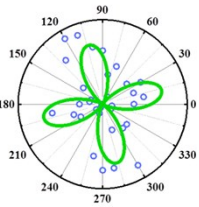
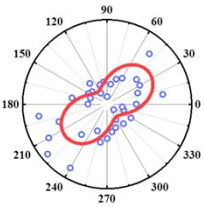
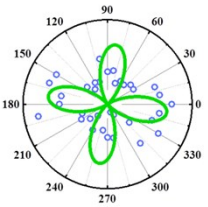


Fig. S5 Optical microscope image of $V_2P_4S_{13}$ flake for angle-resolved polarized Raman spectroscopy measurements.

Table S1 Polar plots of selected Raman modes under parallel and vertical polarization configurations.

74 cm^{-1}		409 cm^{-1}	
//	⊥	//	⊥
			

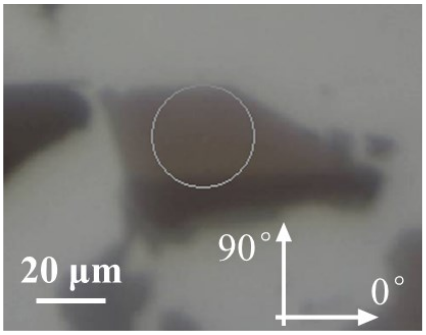


Fig. S6 Optical microscope image of $V_2P_4S_{13}$ flake under transmittance mode for polarization-resolved absorption spectroscopy measurements.