

**Table S1** Linear fitting relationship of CFSD model for RB-KNB on  $\text{Al}_2\text{O}_3\text{-SiO}_2$  and  $\text{TiO}_2/\text{Al}_2\text{O}_3\text{-SiO}_2$  membranes

Membrane	Linear fitting equation	$1/k$ (*10 <sup>2</sup> cm/s)	$\ln(D_{\text{AM}} * K / \delta)$ (cm/s)	$R^2$
$\text{TiO}_2/\text{Al}_2\text{O}_3\text{-SiO}_2$	$y=0.367x-7.145$	0.368	-7.146	0.995
$\text{Al}_2\text{O}_3\text{-SiO}_2$	$y=0.749x-7.971$	0.749	-7.971	0.964