

Supporting File

Investigations of Thermal, Mechanical, and Gas Barrier Properties of PA11-SiO₂ Nanocomposites for Flexible Riser Application

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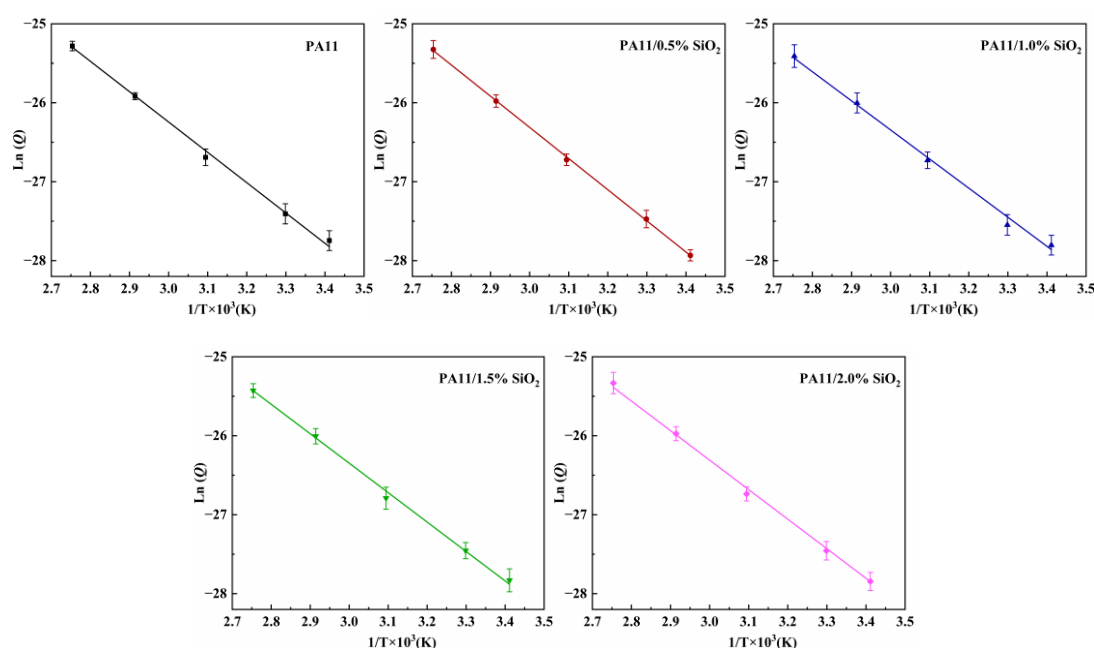


Figure S1 Temperature influence on transport coefficients of CO₂ in PA11/SiO₂ composite, Permeability versus reciprocal temperature

Table S1 Intercept and slope of permeability - temperature fitting curve

Samples	PA11	PA11/0.5%SiO ₂	PA11/1.0%SiO ₂	PA11/1.5%SiO ₂	PA11/2.0%SiO ₂
Intercept	-14.72	-14.47	-15.29	-15.16	-15.09
Slope	-3841.74	-3946.74	-3684.95	-3727.81	-3738.94

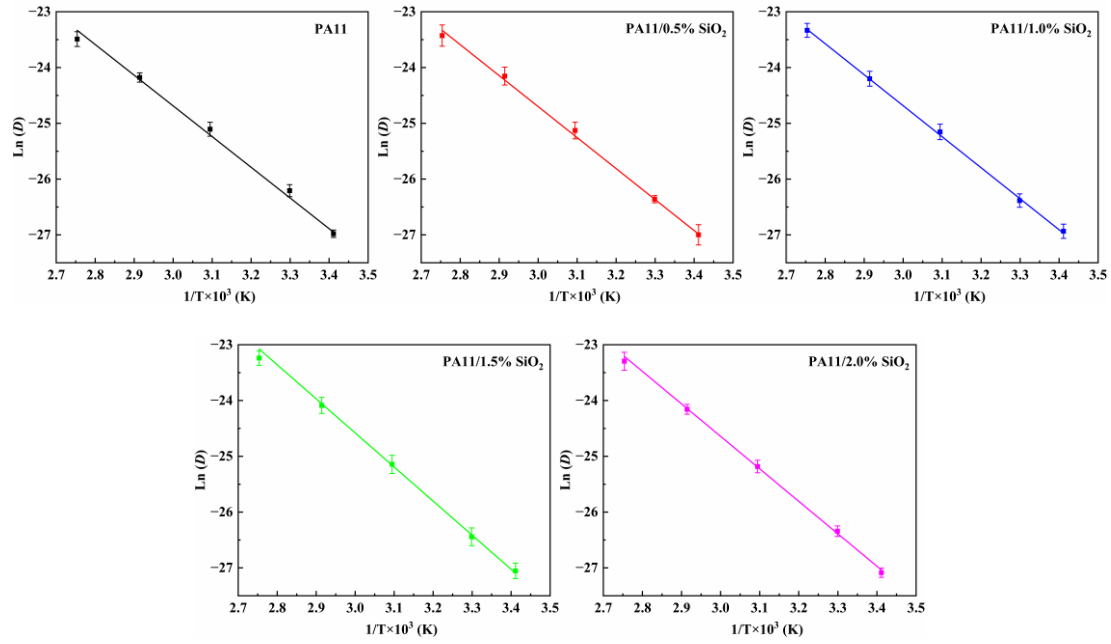


Figure S2 Temperature influence on transport coefficients of CO₂ in PA11/SiO₂ composite, Diffusion versus reciprocal temperature

Table S2 Intercept and slope of Diffusion - temperature fitting curve

Samples	PA11	PA11/0.5%SiO ₂	PA11/1.0%SiO ₂	PA11/1.5%SiO ₂	PA11/2.0%SiO ₂
Intercept	-8.18	-8.04	-8.01	-6.25	-7.18
Slope	-5501.86	-5553.82	-5559.28	-6109.72	-5821.6

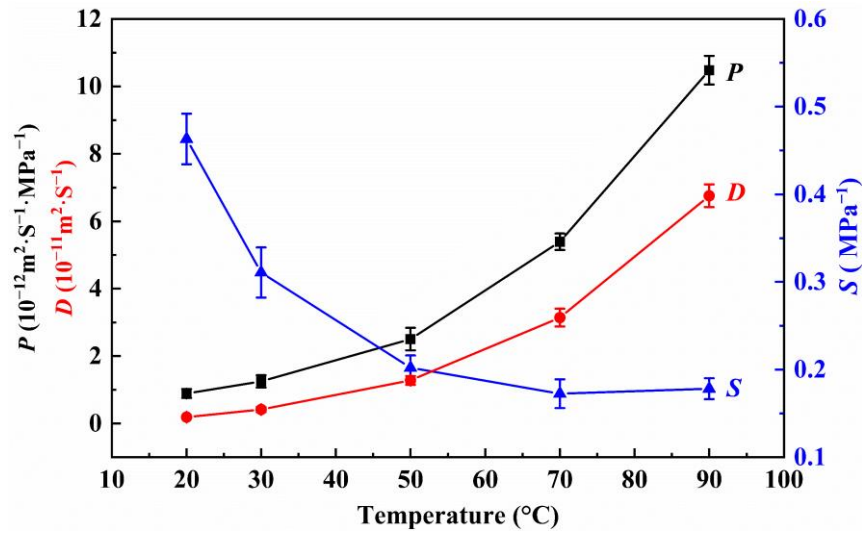
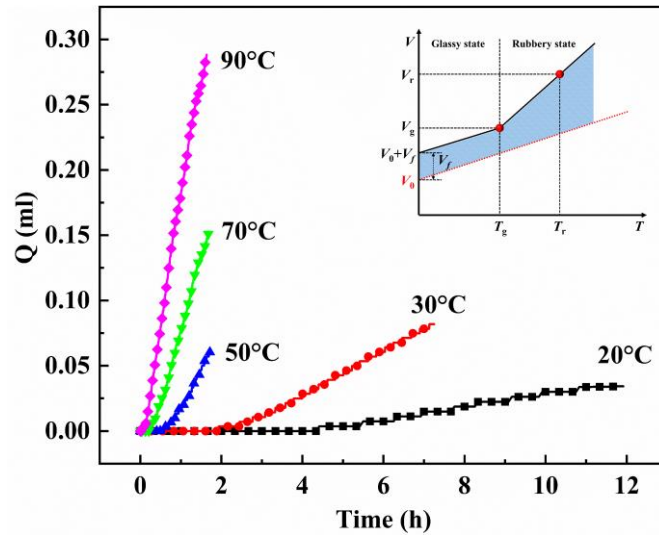


Figure S3 Permeability coefficient, diffusion coefficient, and solubility of CO₂ in PA11 vary with temperature



V_0 -Occupied volume, V_g -The total volume in T_g temperature,

V_f -The free volume below T_g temperature, V_r -The volume at a temperature higher than T_g

Figure S4 Permeation curve of PA11 at 20°C, 30°C, 50°C, 70°C, and 90°C, diagram of free volume with temperature