

# Attapulgite Nanorod-Incorporated Polyimide Membrane for Enhanced Gas Separation Performance

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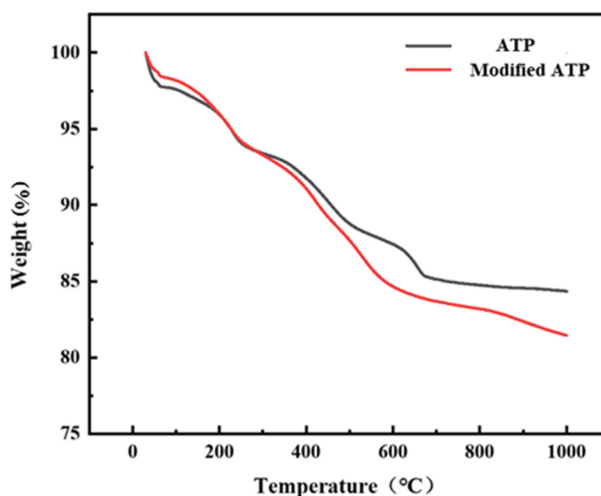


Figure S1. TGA curves of ATP before and after modification

Table S1. Main parameters of thermal properties of pure PI and ATP/PI composite films

Samples	T <sub>g</sub> /°C	T <sub>5%</sub> /°C	T <sub>10%</sub> /°C	T <sub>30%</sub> /°C	R <sub>w850</sub> /°C	T <sub>max</sub> /°C	CTE1 /ppm	CTE2 /ppm	CTE3 /ppm
ATP	-	212.9	357.5	-	78.9	421.8	-	-	-
Pure PI	368.1	571.3	586.7	629.7	56.2	600.9	43.1	48.7	220.1
PI-10wt% PI	369.4	557.5	583.8	631.8	57.2	602.8	36.5	41.2	135.8
PI-20wt% PI	374.9	553.0	583.9	641.7	60.2	602.9	33.6	38.2	115.6
PI-30wt% PI	375.5	542.8	581.5	650.3	62.0	603.1	31.3	37.7	83.03
PI-40wt% PI	376.2	502.3	576.1	650.7	62.2	603.4	27.0	32.5	54.4

PI-50wt% PI	379.8	499.6	578.7	666.1	63.6	603.6	26.2	31.3	45.0
PI-60wt% PI	381.9	491.6	576.8	696.5	66.1	601.9	25.4	30.7	39.0

**Table S2.** Gas selectivity of ATP/PI composite membranes at different gas pressures

Pressure (bar)	CO <sub>2</sub> /CH <sub>4</sub>	CO <sub>2</sub> /N <sub>2</sub>	H <sub>2</sub> /CH <sub>4</sub>	H <sub>2</sub> /N <sub>2</sub>
2	43	32.88	96.23	73.59
4	33.15	25.98	99.76	78.21
6	32.825	25.43	103.79	80.43
8	31.43	25.22	101.51	81.46