Comparison of differences in flame retardancy of cotton fabrics caused by the introduction of cyclic polysiloxane into P/N organic coatings

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Table S1 The weight gain, flame retardancy and mechanical performance parameters of the samples

Sample	WG (%)	LOI (%)	Afterflame time (s)	Afterglow time (s)	Char length (cm)	tensile strength		Whiteness
						Warp	Weft	
Control	0	18	17.6	18.5	-	474	440	81.1
ASPP cot-1	9.7	29.8	0	0	9.0			
ASPP cot-2	12.8	30.8	0	0	7.2			
ASPP cot-3	16.5	32.4	0	0	6.5	507	411	73.8
ASPP-Si cot-1	8.9	27.3	0	0	10.3			
ASPP-Si cot-2	13.1	29.3	0	0	9.8			
ASPP-Si cot-3	17.3	31.1	0	0	7.3	527	453	77.8
10% PBTCA-cot		19.2	3.1	1.0	-			

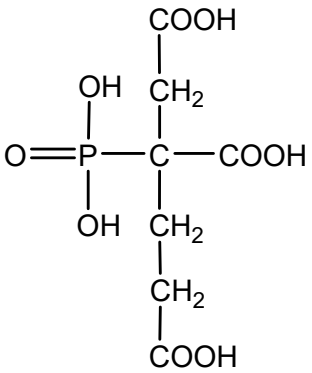


Fig. S1 Structure of PBTCA

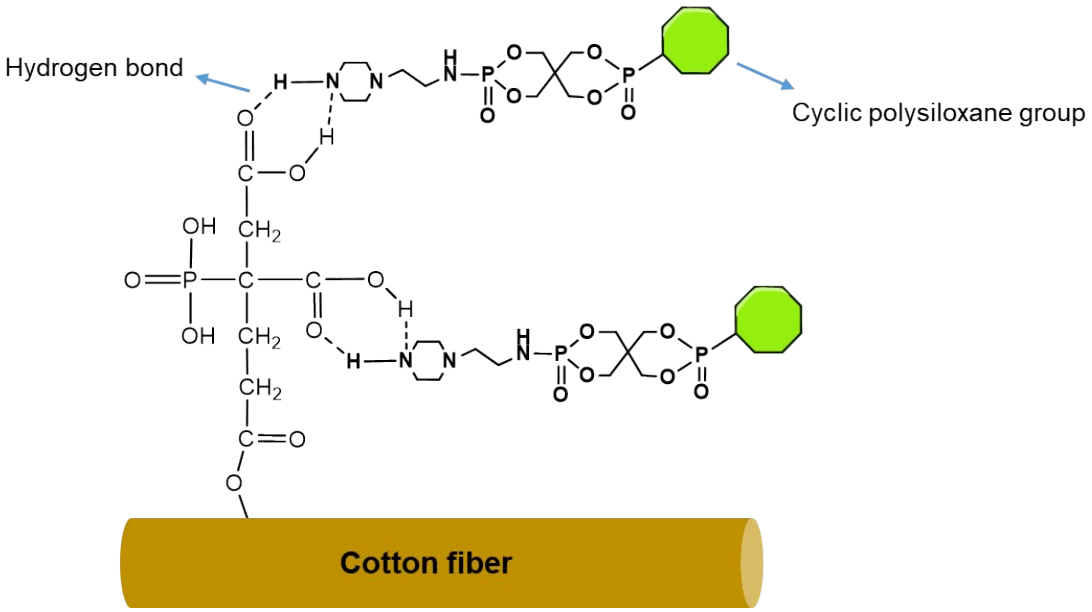


Fig. S2 Reaction of cotton fabric with flame retardant by PBTCA

Fig. S3 Photos of treated cotton fabrics with 10% PBTCA after vertical flammability test

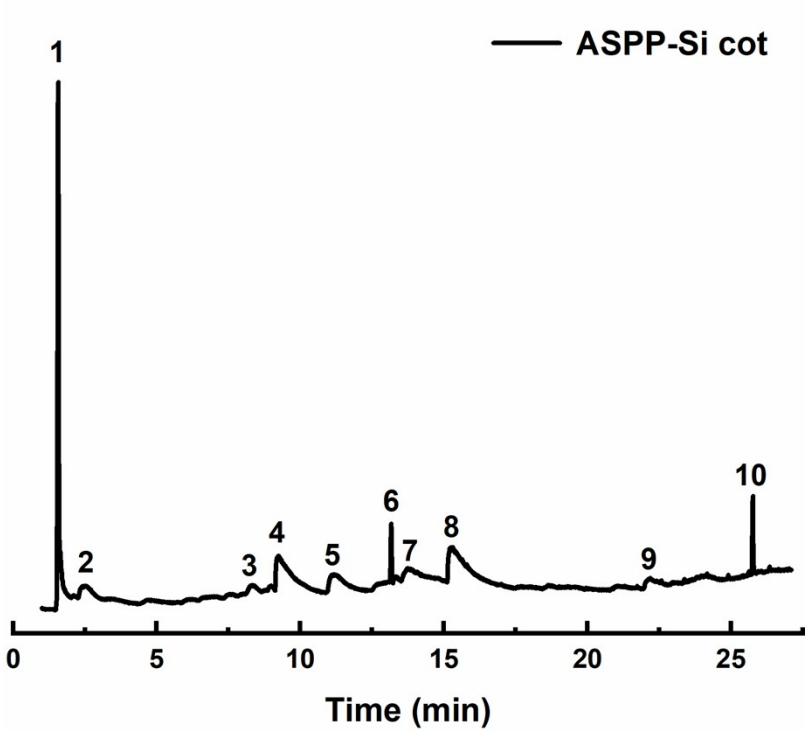
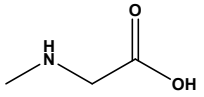
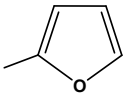
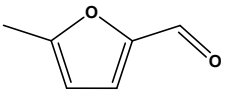
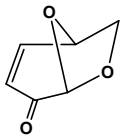
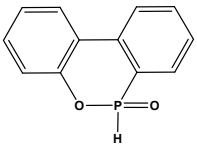


Fig. S4 The total ion chromatogram of ASPP-cot in Py-GC-MS tests at 350 °C

Table S2 Possible pyrolytic products of ASPP-Si cot at 350 °C

Peak	Retention time (min)	MW	Assigned structure
1	1.57	89	
2	2.41	82	
3	8.30	110	
4	9.20	126	
5	11.13	216	

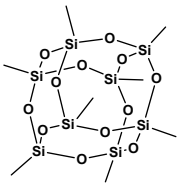
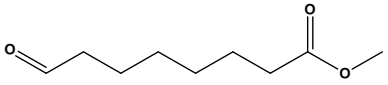
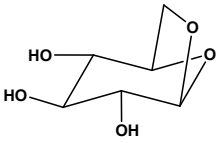
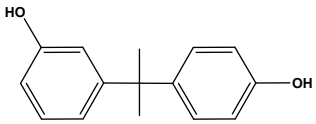
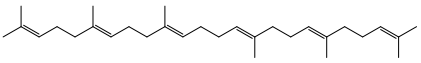
6	13.17	536	
7	13.72	172	
8	15.22	162	
9	22.12	228	
10	25.76	410	

Table S3 LOI value of treated cotton fabrics after washing

Washing times	0	5	10	15	20
ASPP cot-3	32.4	29.5	27.0	25.7	24.8
ASPP-Si cot-3	31.1	28.8	26.7	25.5	24.5

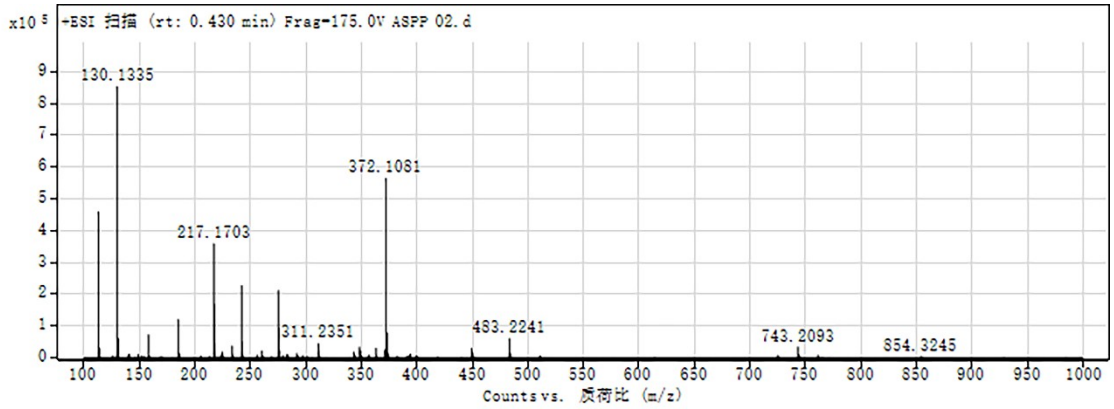


Fig. S5 The ESI mass spectrum of ASPP (positive mode)

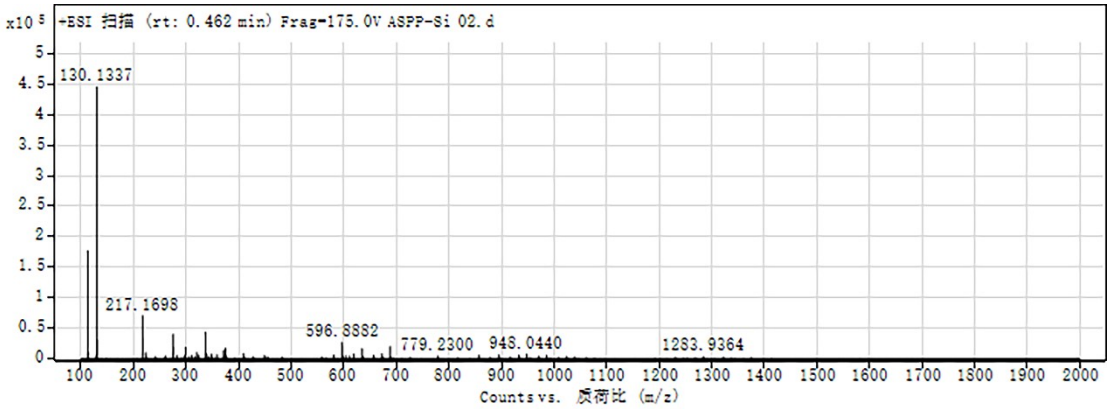


Fig. S6 The ESI mass spectrum of ASPP-Si (positive mode)