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Article

Suppression of Smoldering of Calcium Alginate Flame-Retardant Paper by Flame-Retardant Polyamide-66

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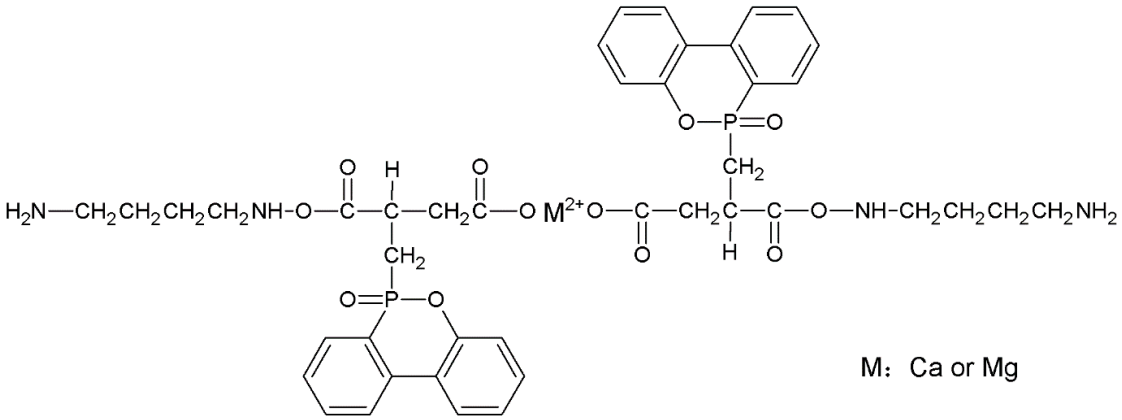

Figure S1. Structural formula of phosphorus flame retardant in FR-PA fiber.

Table S1. Composition of the prepared paper samples.

	Wood Pulp (wt%)	FR-PA Pulp (wt%)	Ca-Alg Pulp (wt%)
Wood pulp paper	100	0	0
Ca-Alg paper	0	0	100
FR-PA/Ca-Alg (10/90)	0	10	90
FR-PA/Ca-Alg (20/80)	0	20	80
FR-PA/Ca-Alg (30/70)	0	30	70
FR-PA/Ca-Alg (40/60)	0	40	60

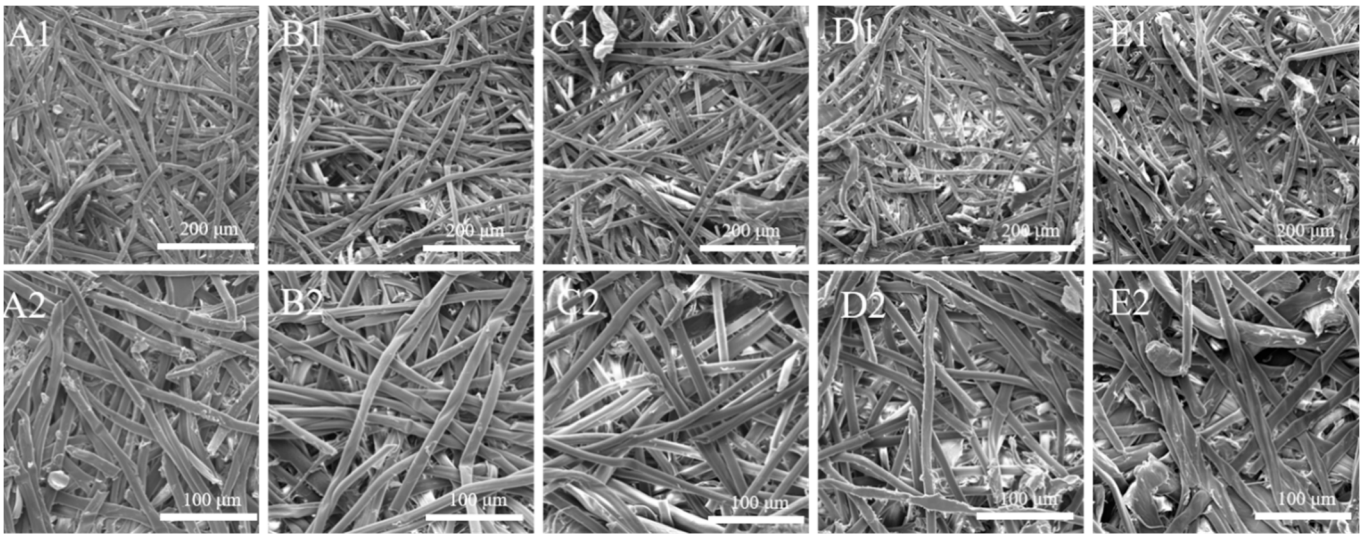

Figure S2. SEM photographs of Ca-Alg paper (A1, A2), FR-PA/Ca-Alg (10/90) paper (B1, B2), FR-PA/Ca-Alg (20/80) paper (C1, C2), FR-PA/Ca-Alg (30/70) paper (D1, D2) and FR-PA/Ca-Alg (40/60) paper (E1, E2) at different magnification (×500, ×1000).

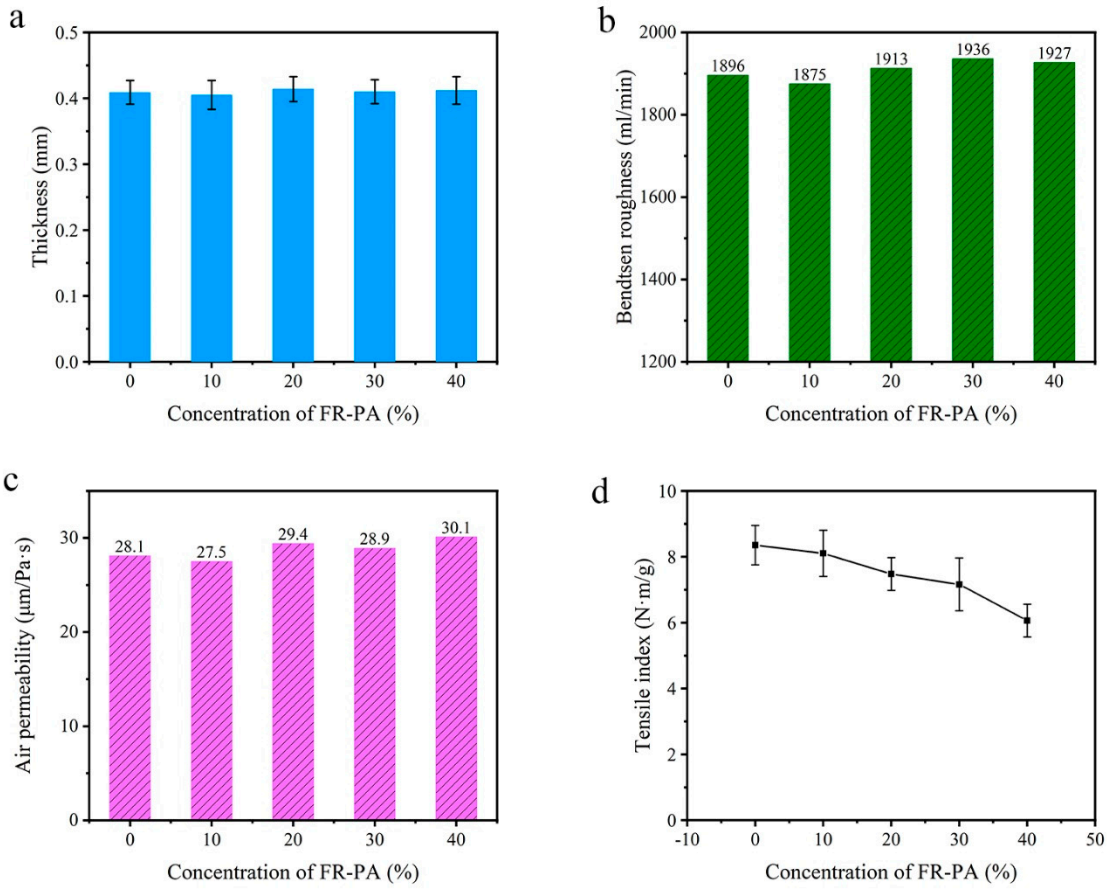

Figure S3. Physical properties of prepared paper: (**a**) thickness, (**b**) Bendtsen roughness, (**c**) air permeability and (**d**) tensile index of Ca-Alg and composite papers.

As shown in Figure S3a, the thickness of Ca-Alg, FR-PA/Ca-Alg (10/90), FR-PA/Ca-Alg (20/80), FR-PA/Ca-Alg (30/70) and FR-PA/Ca-Alg (40/60) paper is 0.409, 0.405, 0.414, 0.410 and 0.412 mm, respectively, which is almost the same. Figure S3d shows the tensile index Ca-Alg and composite papers. it can be seen that the tensile index of composite papers decrease gradually as the FR-PA concentration increases. The tensile index of the Ca-Alg paper is 8.35 Nm/g,

whereas the tensile index of FR-PA/Ca-Alg (30/70) composite paper is 7.16 Nm/g, 14.25% lower, indicating that FR-PA reduces the tensile strength of the composite paper, but the change value is not large in the case of no adhesive. The tensile strength of composite paper can be improved by adding a binder.