--------Supplementary information--------

Fabrication of new multifunctional cotton-modal-recycled aramid blended protective textiles through deposition of 3D-polymer coating: High fire retardant, water repellent and antibacterial property

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1. Experimental

1.1. Synthesis of Tetrakis (hydroxymethyl) phosphonium chloride (THPC)

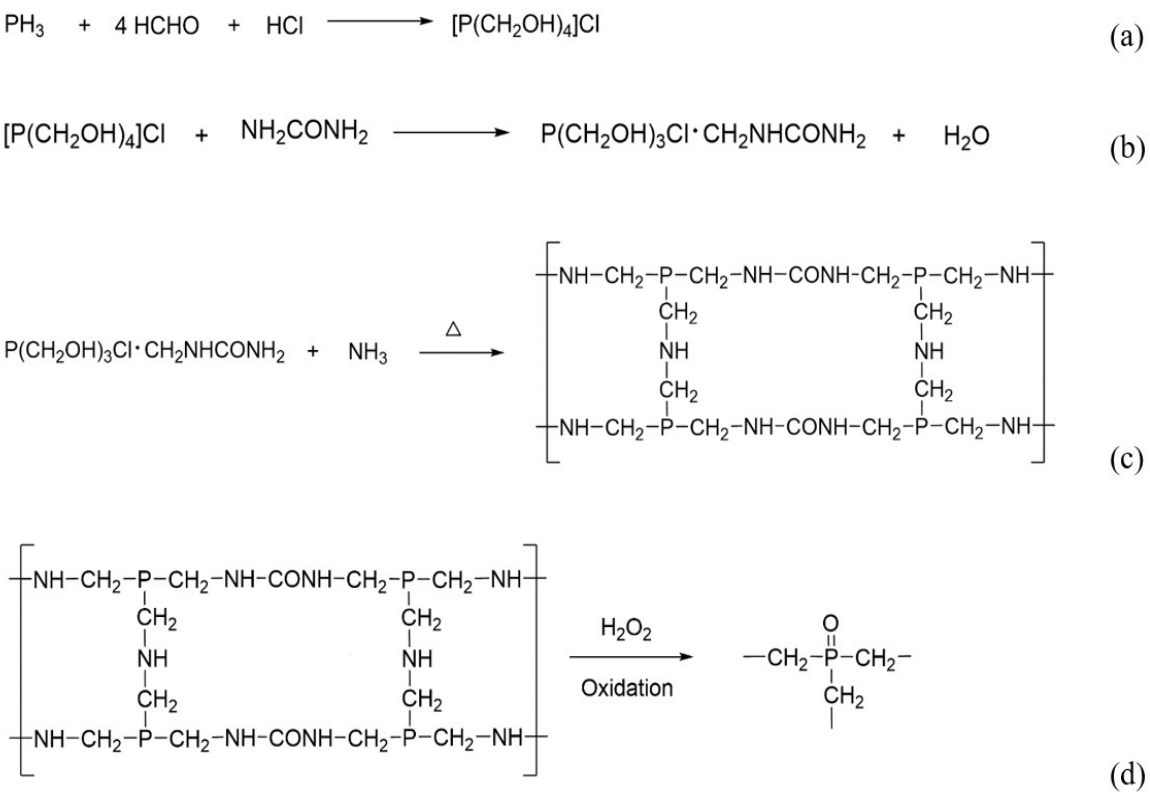

Figure 1: THPC reaction mechanism.

2. RESULTS

2.1. Physical analysis of the samples

Table S1: Water vapor permeability and air permeability analysis

Sample	[a]Water Vapor Permeability ($g/m^2.h$)	[b]Air permeability (mm/s)
C100	196.51	126.5
CMA-1	193.68	22.1
CMA-2	182.24	16.9
CMA-3	193.68	170.1
CMA-4	184.01	116.3
[a]Experiment Method: KS K 0594:2015. [b]Experiment Method: KS K ISO 9237:1995, Sample fabric: 20 cm^2, Static pressure: 100 Pa, (mm/s)*6 = ($cm^3/min/cm^2$)		

2.2. Dimensional change analysis after washing and drying.

Table S2: Analysis of dimensional change (%) after washing and drying

Sample	Warp	Weft
C100	-1.5	-1
CMA-1	-3.5	-1
CMA-2	-3.5	-1
CMA-3	-3.5	-1
CMA-4	-3	-1
Experiment Method: KS K ISO 5077:2014 (Laundry Method: KS K ISO 6330:2011, 9B) Kenmore Automatic Washing Machine, Normal Cycle, (30±3)°C, WOB, Net Dry, Laundry weight-2 k)		