

Supplementary Materials: Application of Magnesium Hydroxide/Diphenoxy Phosphate in Silicone Rubber Flame Retardant Cable Material

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Table S1. Mechanical properties of different quality of carbon black.

Entry	phr	Elongation at break /%	Tensile strength (MPa)	Tearing strength(MPa)	Shore A hardness (°)
	0	142±12	0.81±0.16	1.21	28
2	10	201±17	2.33±0.26	2.55	33
3	20	230±15	2.65±0.37	2.72	35
4	30	244±18	3.07±0.31	2.81	38
5	40	271±20	3.11±0.29	2.89	40
6	50	261±17	3.09±0.32	2.93	39

Table S2. Effect of different quality of carbon black on surface drying time and depth of cure.

Entry	1	2	3	4	5	6	11
surface drying time (min)	31.2	26.8	24.1	23.0	22.6	22.5	24.7
depth of cure(mm/24h)	3.2	3.6	3.8	3.7	3.6	3.3	3.5

Table S3. Experimental data of cone calorimeter for room temperature vulcanized rubber containing different flame retardants.

Sample number	The ignition time (TTL, s)	The maximum heat release rate (pkHRR, kW/m ²)	The average heat release rate (180s, HRR, kW/m ²)	Total heat release rate (THR, MJ/m ²)
7 0g Mg(OH) ₂	23±3	219.54	117.403	35.43
4 30g Mg(OH) ₂	31±4	103.78	51.694	9.69
8 20g Mg(OH) ₂ 10g PBDP	34±3	123.89	82.708	15.37
9 10g Mg(OH) ₂ 20g PBDP	36±2	230.89	87.551	17.83
10 30g PBDP	43±2	232.72	91.046	16.92
11 20g Mg(OH) ₂ 10g MDP	39±2	154.28	59.166	11.05
12 10g Mg(OH) ₂ 20g MDP	44±2	177.73	74.96	13.94
13 30g MDP	49±2	153.68	111.734	20.31
14 10g Mg(OH) ₂ 10g PBDP 10g MDP	36±3	203.28	63.47	15.57

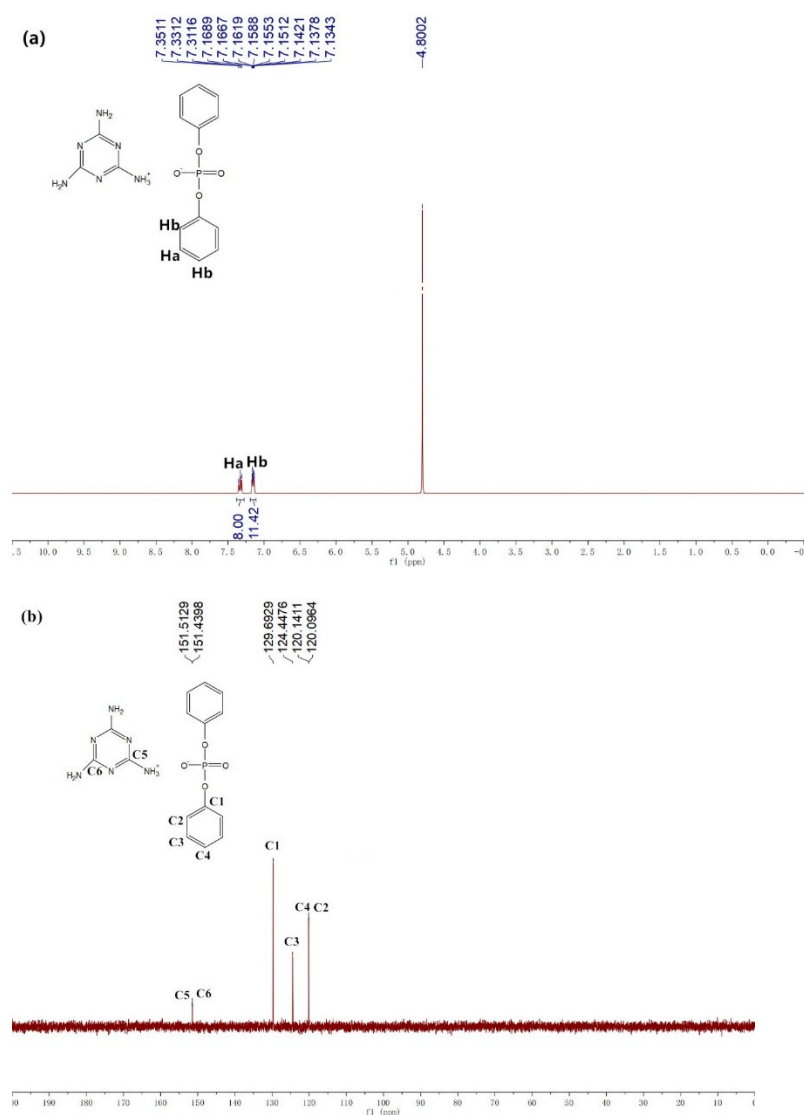


Figure S1. The NMR spectrum of Melamine diphenoxy phosphate (MDP): (a) ^1H NMR, and (b) ^{13}C NMR.

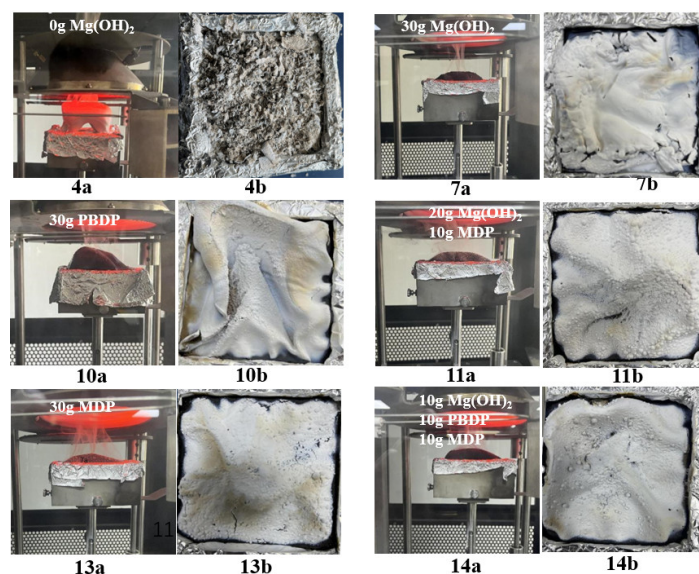


Figure S2. Burning test diagram of some materials: (a) Before burning, (b) After burning.

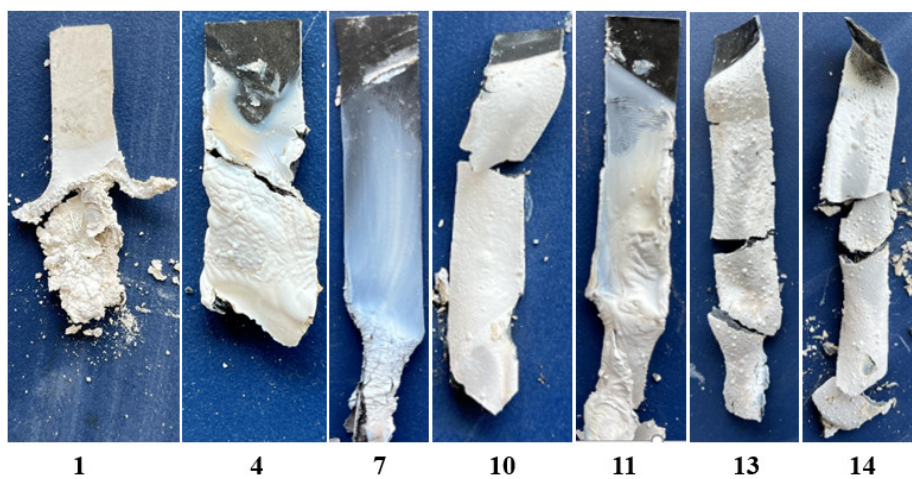


Figure S3. Vertical combustion test diagram of some materials.