

SUPPLEMENTARY MATERIALS

1. Possible crosslinking structure

It is possible to occur PVC cross-linking reactions. There may appear small amounts of crosslinked PVCs. PVC-H-C, PVC-TH-C and PVC-IP-C may have the following structure.

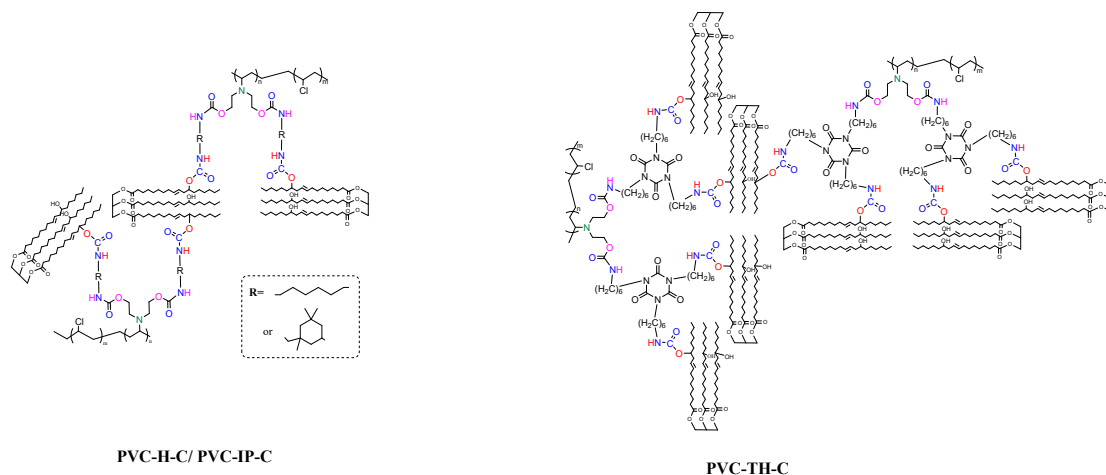


Fig. S1. Possible crosslinking structure of PVC-H-C, PVC-TH-C and PVC-IP-C.

2. GPC

The average value and distributions of molecular weights of PVC materials were analyzed via GPC, and the reaction level was assessed by analyzing the molecular weight changes.

GPC chromatograms of PVC, PVC-H-C, PVC-TH-C and PVC-IP-C were shown in Figure S2. The peaks of the molecular weight curves of the three modified PVC materials are all below that of pure PVC (Figure S2), indicating the molecular weights of the modified PVC move to the high level compared with pure PVC. This is because the Cl atom is replaced by the macromolecular graft, which increases the overall molecular weight of the material, and the M_n , M_w , PDI are provided.

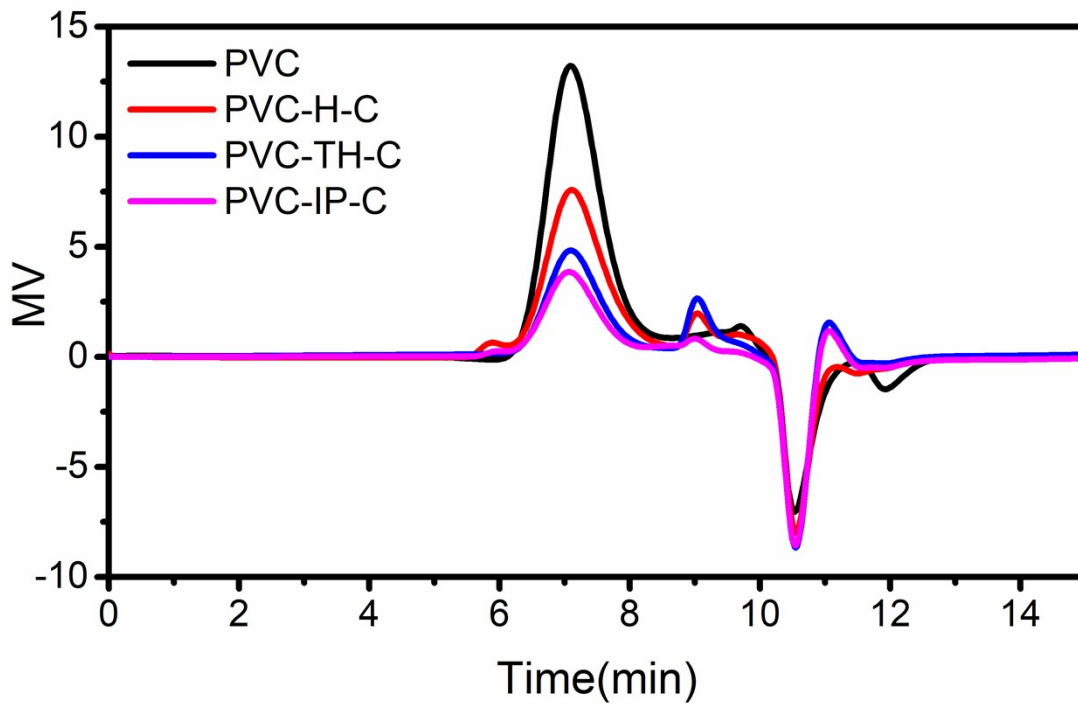


Fig. S2. Gel permeation chromatograms of PVC, PVC-H-C, PVC-TH-C and PVC-IP-C.

Table 1. GPC data of PVC, PVC-H-C, PVC-TH-C and PVC-IP-C

Sample	M_n	M_w	Polydispersity
PVC	43764	89831	2.0526
PVC-H-C	63564	127327	2.0031
PVC-TH-C	71276	136082	1.9092
PVC-IP-C	81062	145130	1.7903

3. SEM

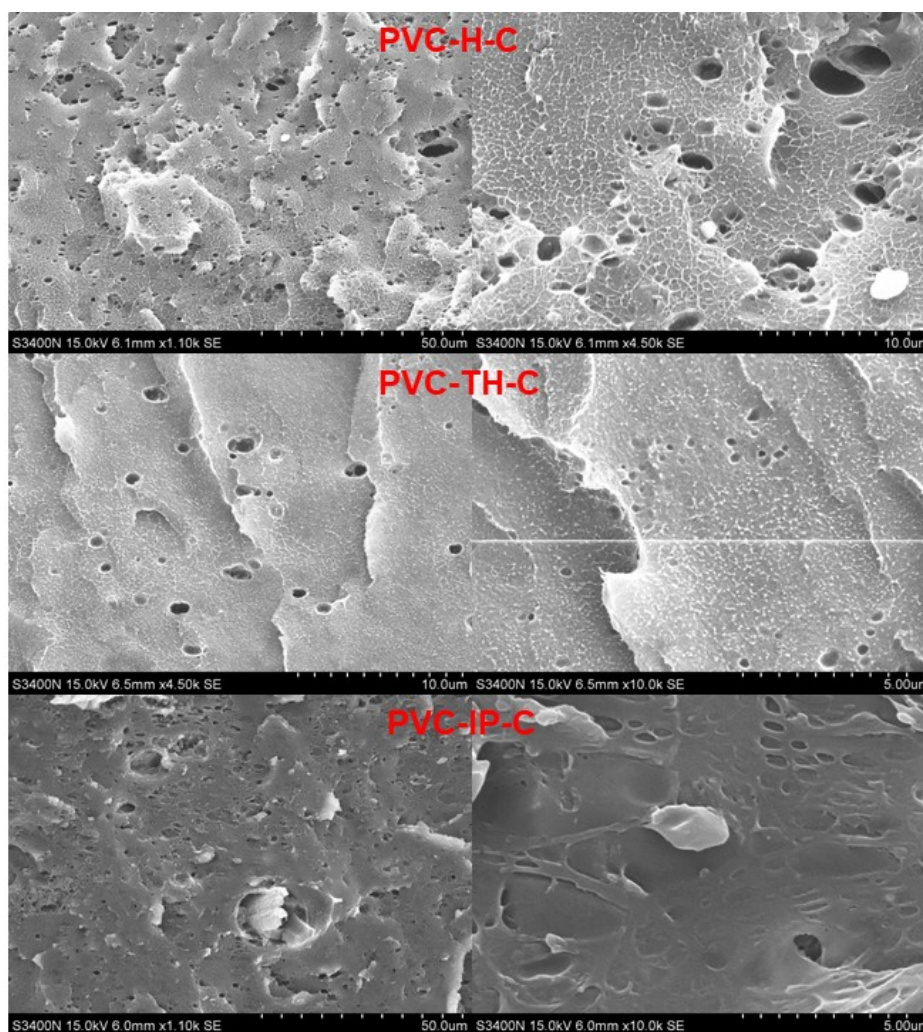


Fig. S3. SEM at high magnification

4. Thermal aging test

Figure S4 describes the thermal aging of PVC and three types of plasticized PVC. Four samples were placed in a 180 °C oven, and the time at 180 °C is from left to right. Among them, PVC-H-C and PVC-TH-C both maintained good initial whiteness at the initial stage. The yellowing of PVC-IP-C was very fast and started almost at the beginning. At the same time, the complete blackening of the three types of plasticized PVC materials is obvious. The PVC-TH-C material containing triazine ring is better has the best initial whiteness than the other three, and provides better optical properties at 180 °C.

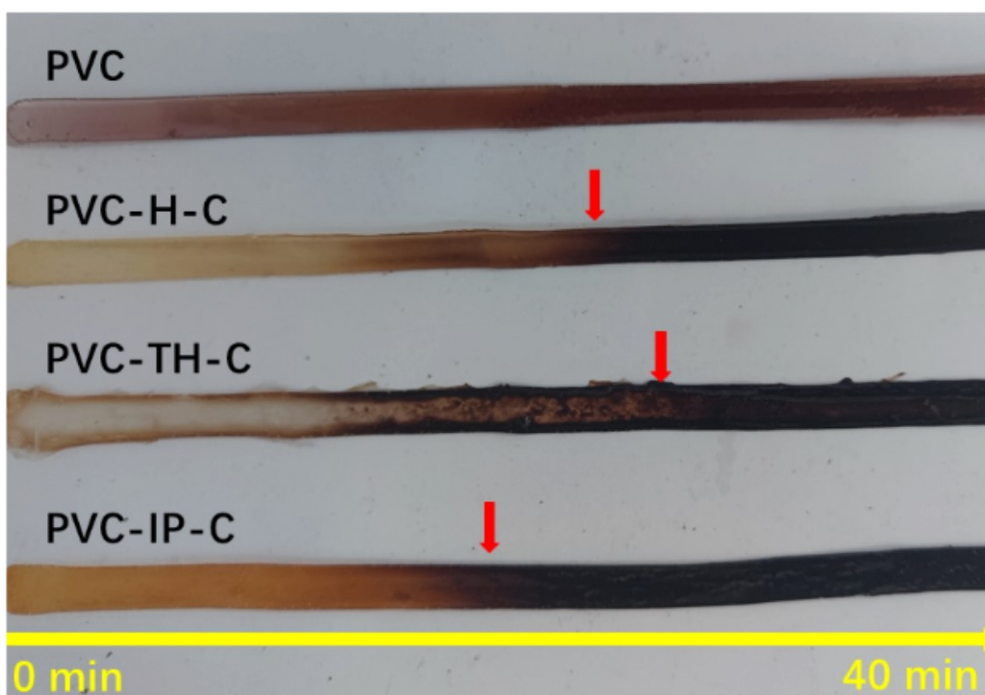


Fig. S4. Thermal aging diagram of PVC, PVC-H-C, PVC-TH-C and PVC-IP-C

5. TG-MS for CO₂

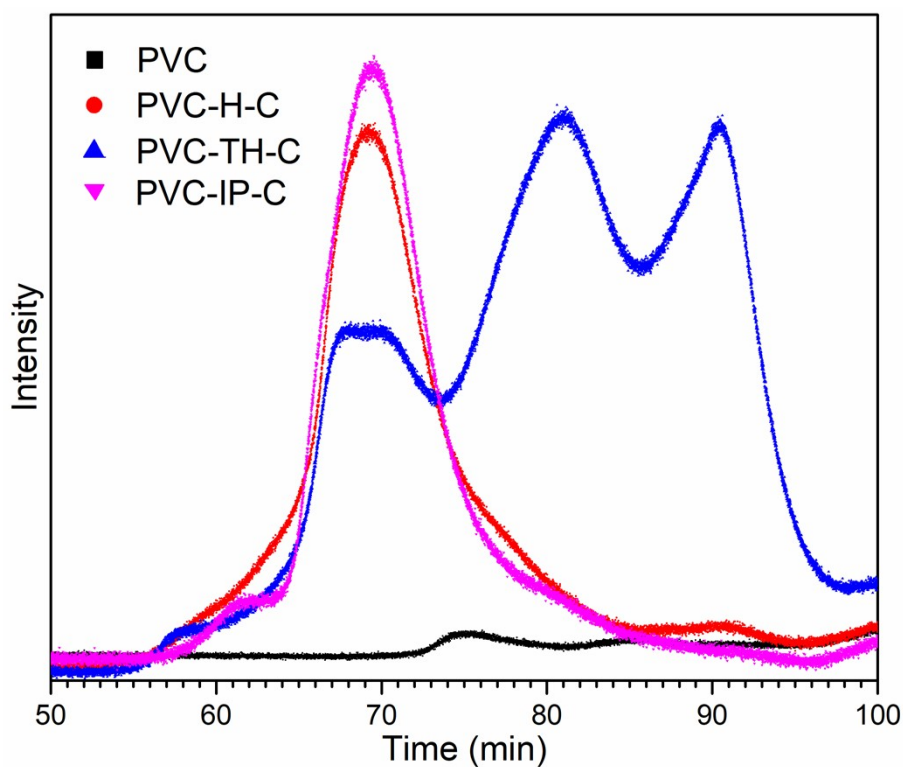


Fig. S5. CO₂ emission of PVC, PVC-H-C, PVC-TH-C and PVC-IP-C during thermal degradation