

Article

An Easy Fabrication Method to Prepare Inexpensive UV-Cured Transparent Silicone Modified Polyacrylate Coatings with Good Adhesion and UV Resistance

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1. SEC analysis of the copolymers

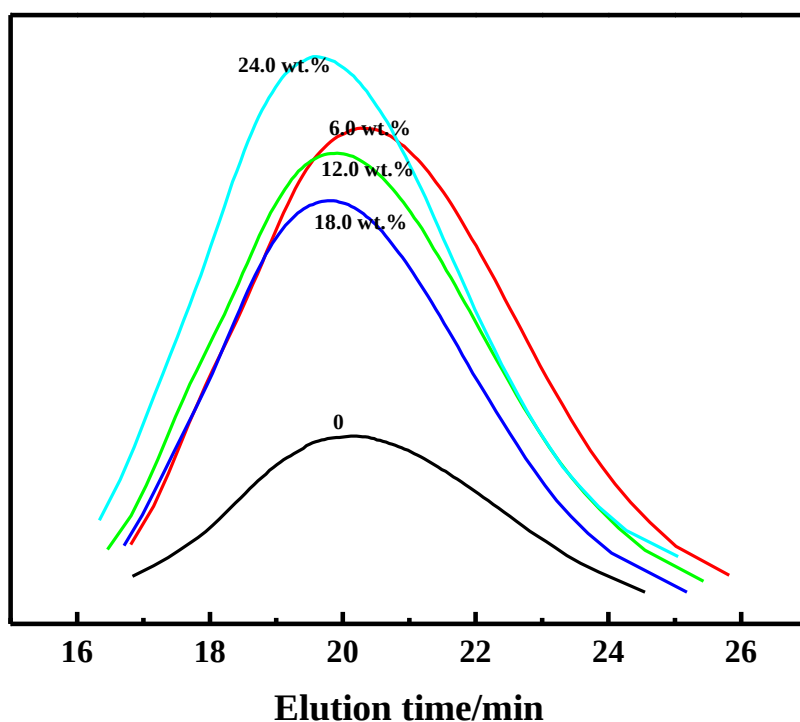


Figure S1. SEC curves of the copolymer with various of styrene content.

The SEC curves of the copolymer with various of styrene content were shown in Figure S1. The molecular weight of the copolymers were following: 0, 2.65×10^4 ; 6.0 wt.%, 2.85×10^4 ; 12.0 wt.%, 3.10×10^4 ; 18.0 wt.%, 3.25×10^4 ; 24.0 wt.%, 3.80×10^4 .

2. FT-IR analysis of the copolymers

FT-IR analysis of the copolymers was carried out as shown in Figure S2. It can be seen that the absorption at 3500 cm^{-1} is characteristic peak of the association of carboxyl group from acrylic acid with hydroxypropyl from hydroxypropyl methacrylate. The absorption at 1730 cm^{-1} can be ascribed to be characteristic peak of carbonyl group in copolymer and the weak absorption at 1621 cm^{-1} can be ascribed to be characteristic peaks of terminal acrylate group in the copolymer. The absorptions at $3030\text{--}2845\text{ cm}^{-1}$ and $1942\text{--}1801\text{ cm}^{-1}$ are ascribed to be characteristic peaks of unsaturated hydrocarbon bond and stretching vibration peaks of $\text{C}=\text{H}$ in benzene ring from styrene respectively.

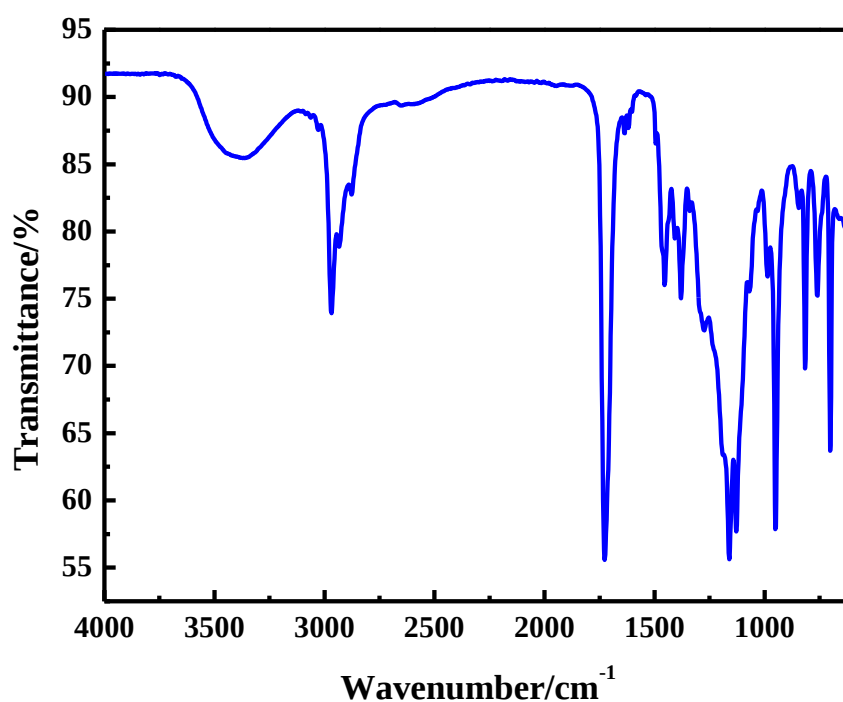


Figure S2. FT-IR spectrum for copolymers prepared of acrylate monomers and styrene.

3. ^1H -NMR analysis of the copolymers

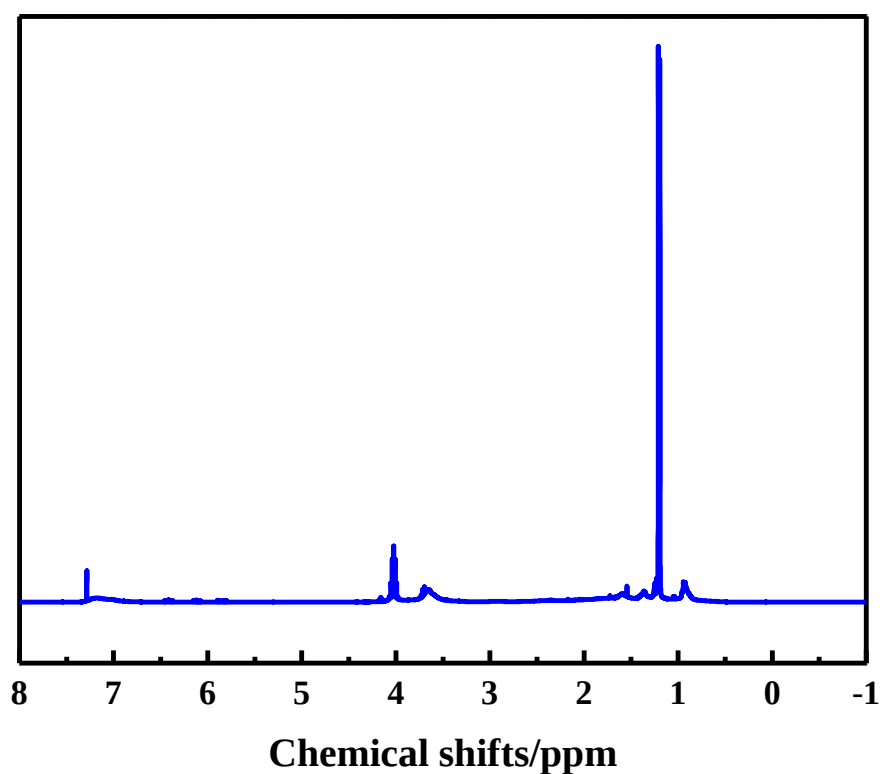
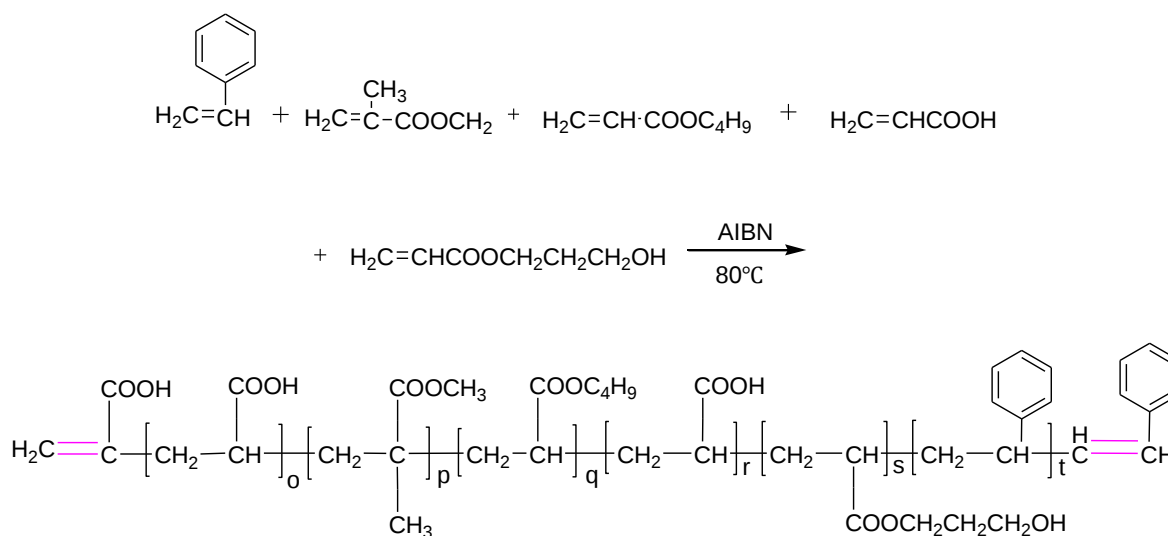


Figure S3. ^1H -NMR spectrum for copolymers prepared of acrylate monomers and styrene.

^1H -NMR analysis was performed to determine the chemical structure of the copolymers (Figure S3) and the chemical shifts are ascribed as following:

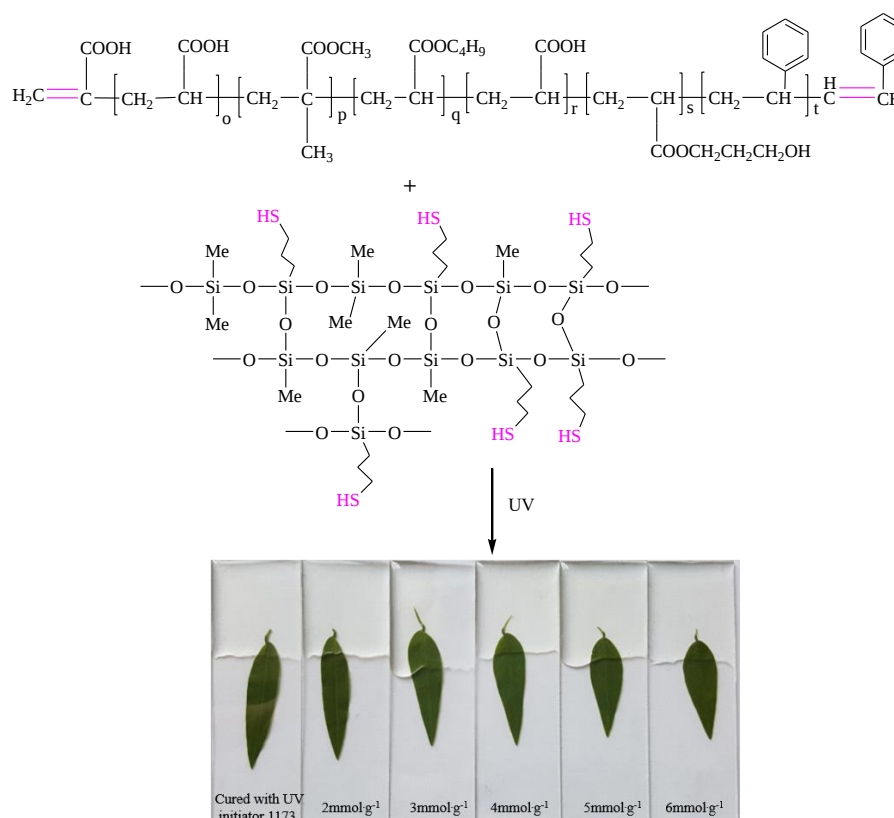
^1H -NMR (400MHz, CDCl_3): δ (ppm) 6.8–7.3 (3H, $-\text{C}_6\text{H}_5$ of styrene), 0.8–1.0 (3H, $-\text{CH}_3$), 3.3–3.8 (3H, $-\text{OCH}_3$ of acrylate derivatives), 1.4–1.7 (2H, $-\text{CH}_2-$ of acrylate derivatives).

4. The scheme for preparation of copolymers of acrylates and styrene



Scheme S1. The scheme for preparation of copolymers of acrylates and styrene.

5. The scheme for preparation of transparent materials by UV curing method



Scheme S2. The scheme for Preparation of transparent materials by UV curing method.

