

Supporting information

Deformation-Tolerant Linkage of Silicone Rubbers and Carbon-Based Elastomers via Chemical and Topological Adhesion

Daohang Cai ^{a,b}, Yanhao Yu ^{a,c,*}

^a Department of Materials Science and Engineering

Southern University of Science and Technology

Shenzhen 518055, China

^b National Graduate College for Engineers

Southern University of Science and Technology

Shenzhen 518055, China

^c Guangdong Provincial Key Laboratory of Sustainable Biomimetic Materials and Green

Energy; Institute of Innovative Materials

Southern University of Science and Technology

Shenzhen 518055, China

Corresponding E-mail: yuyh@sustech.edu.cn

Supporting Figures

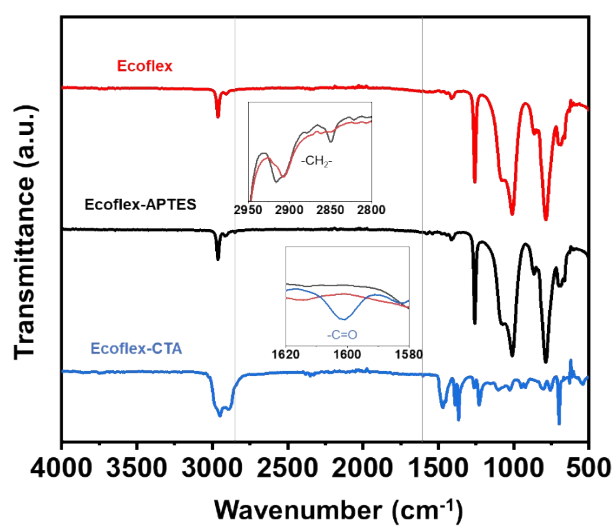


Fig. S1 FT-IR spectra of the pristine Ecoflex, Ecoflex-APTES, and Ecoflex-CTA.

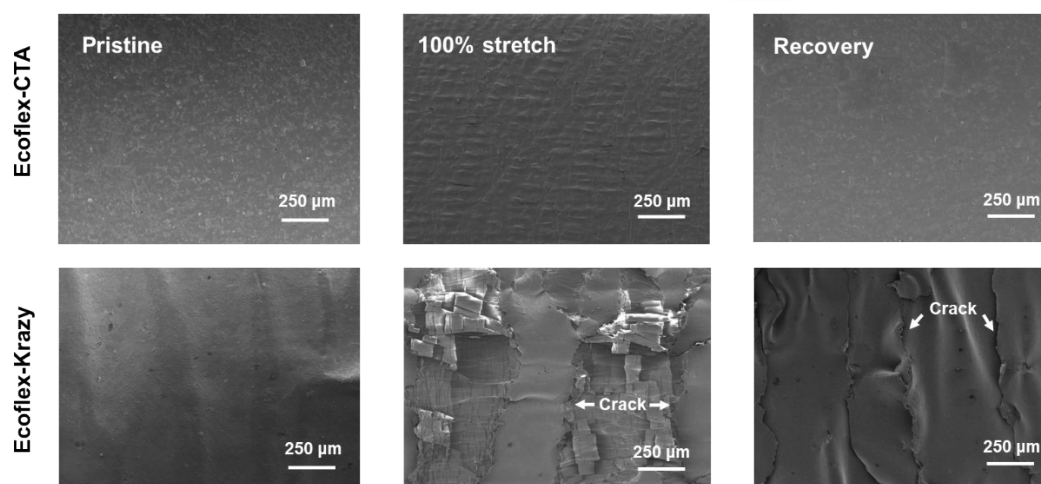


Fig. S2 SEM images of the Ecoflex-CTA and Ecoflex-Krazy before and after stretching.

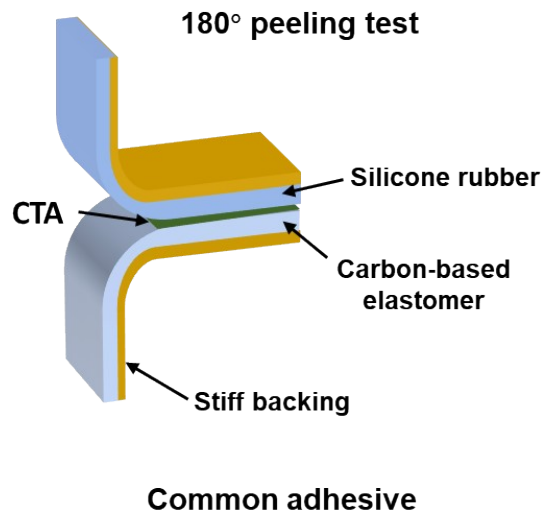


Fig. S3 Scheme of common adhesive (CTA) for 180° peeling test.

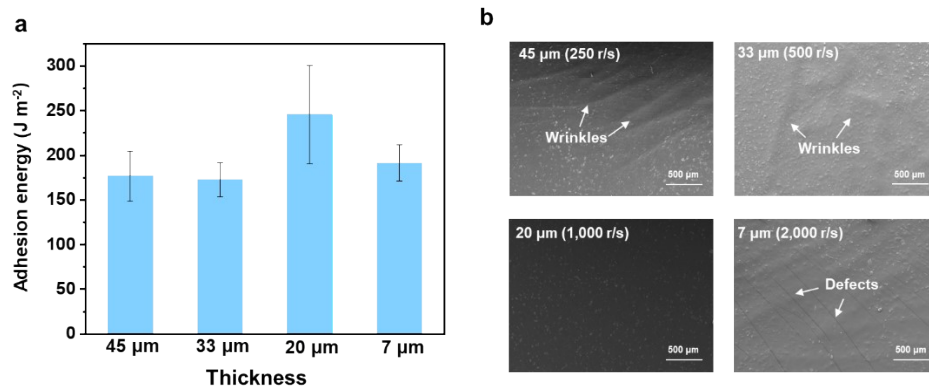


Fig. S4 (a) The interfacial adhesion energy of Ecoflex-CTA-SEBS for different thickness of CTA. (b) The surface SEM images of the CTA with different thickness.

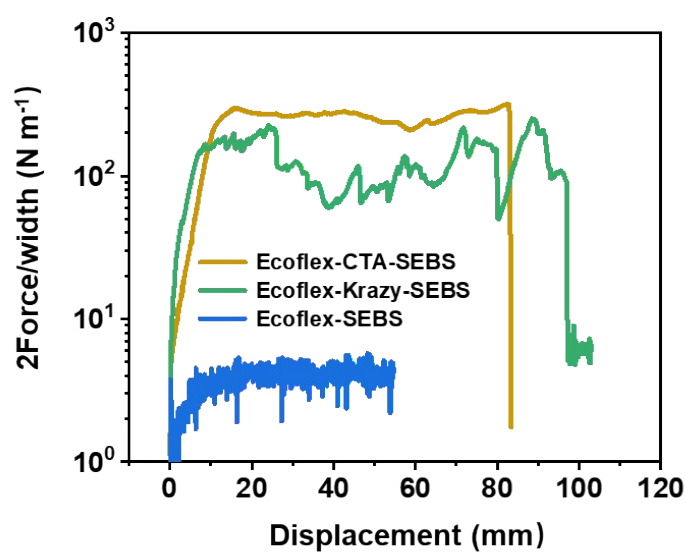


Fig. S5 The 2force-displacement curves of the Ecoflex-CTA-SEBS, Ecoflex-Krazy-SEBS, and Ecoflex-SEBS fabricated by finger-pressing under the 180° peeling test for measuring the interfacial adhesion energy.

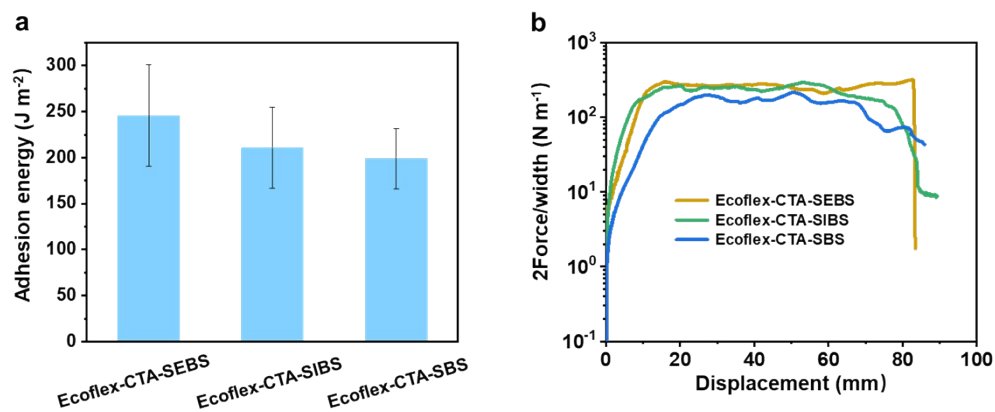


Fig. S6 (a, b) The interfacial adhesion energy (a) and 2force-displacement curves (b) of the Ecoflex-CTA-SEBS, Ecoflex-CTA-SIBS, and Ecoflex-CTA-SBS fabricated by finger-pressing.

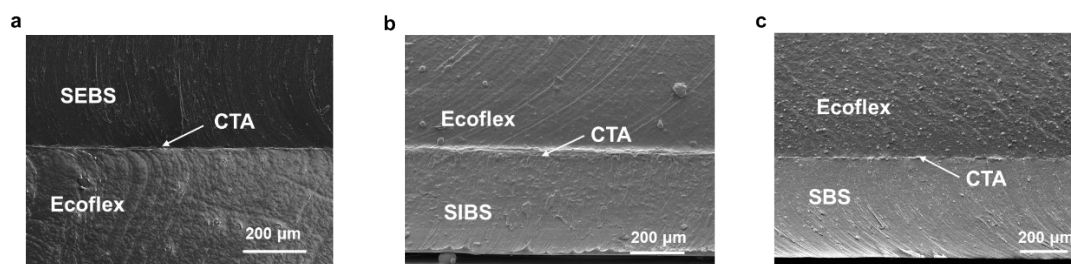


Fig. S7 (a-c) The interface SEM images of the Ecoflex-CTA-SEBS (a), Ecoflex-CTA-SIBS (b), and Ecoflex-CTA-SBS (c).

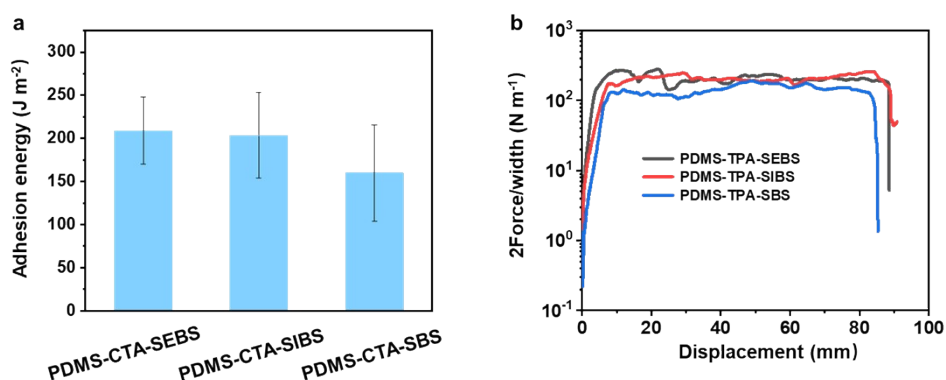


Fig. S8 (a, b) The interfacial adhesion energy (a) and 2force-displacement curves (b) of PDMS-CTA-SEBS, PDMS-CTA-SIBS, and PDMS-CTA-SBS fabricated by finger-pressing.

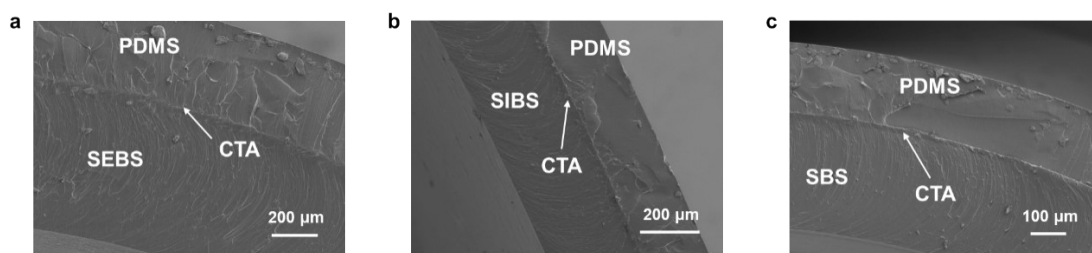


Fig. S9 (a-c) The interface SEM images of the PDMS-CTA-SEBS (a), PDMS-CTA-SIBS (b), and PDMS-CTA-SBS (c).

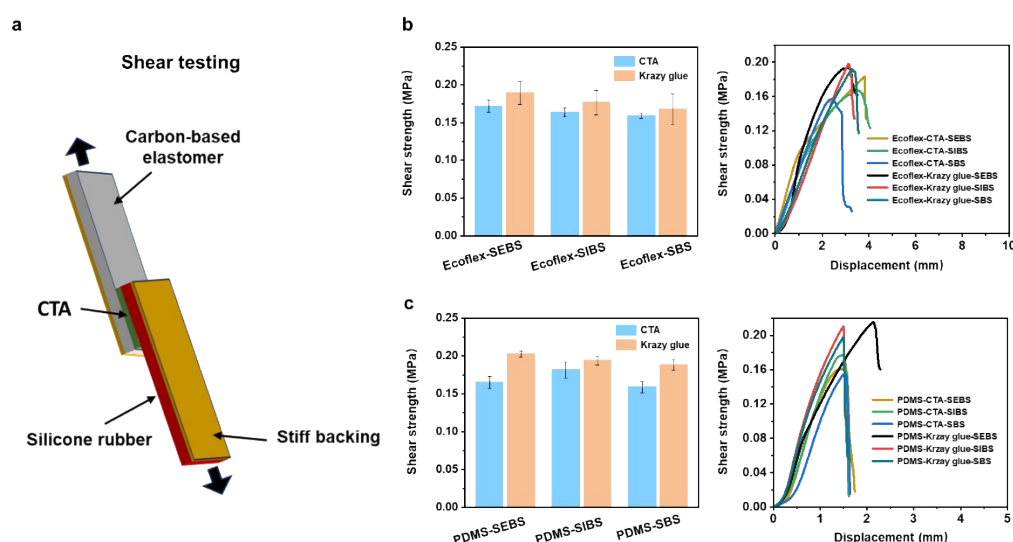
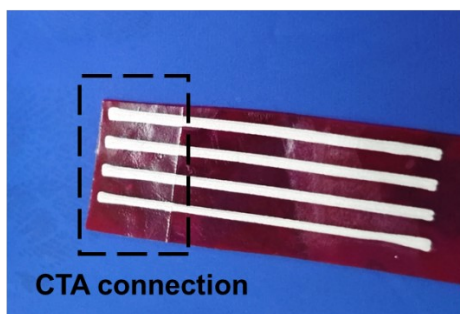


Fig. S10 (a) Scheme of CTA for shear testing. (b) The shear strength and shear strength-displacement curves of the Ecoflex-CTA-SEBS, Ecoflex-CTA-SIBS, Ecoflex-CTA-SBS, Ecoflex-Krazy glue-SEBS, Ecoflex-Krazy glue-SIBS, and Ecoflex-Krazy glue-SBS fabricated by finger-pressing. (c) The shear strength and shear strength-displacement curves of the PDMS-CTA-SEBS, PDMS-CTA-SIBS, PDMS-CTA-SBS, PDMS-Krazy glue-SEBS, PDMS-Krazy glue-SIBS, and PDMS-Krazy glue-SBS fabricated by finger-pressing. The shear strength was calculated as the maximal value of the shear force divided by the bonded area of the samples ($1 \text{ MPa} = 1 \text{ N/mm}^2$).

a



b

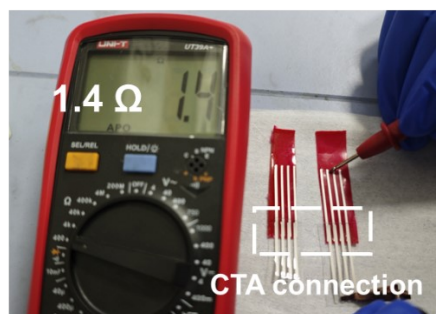


Fig. S11 (a) Photograph of the CTA connection. (b) Photograph of the CTA connection is used in electrical interface.