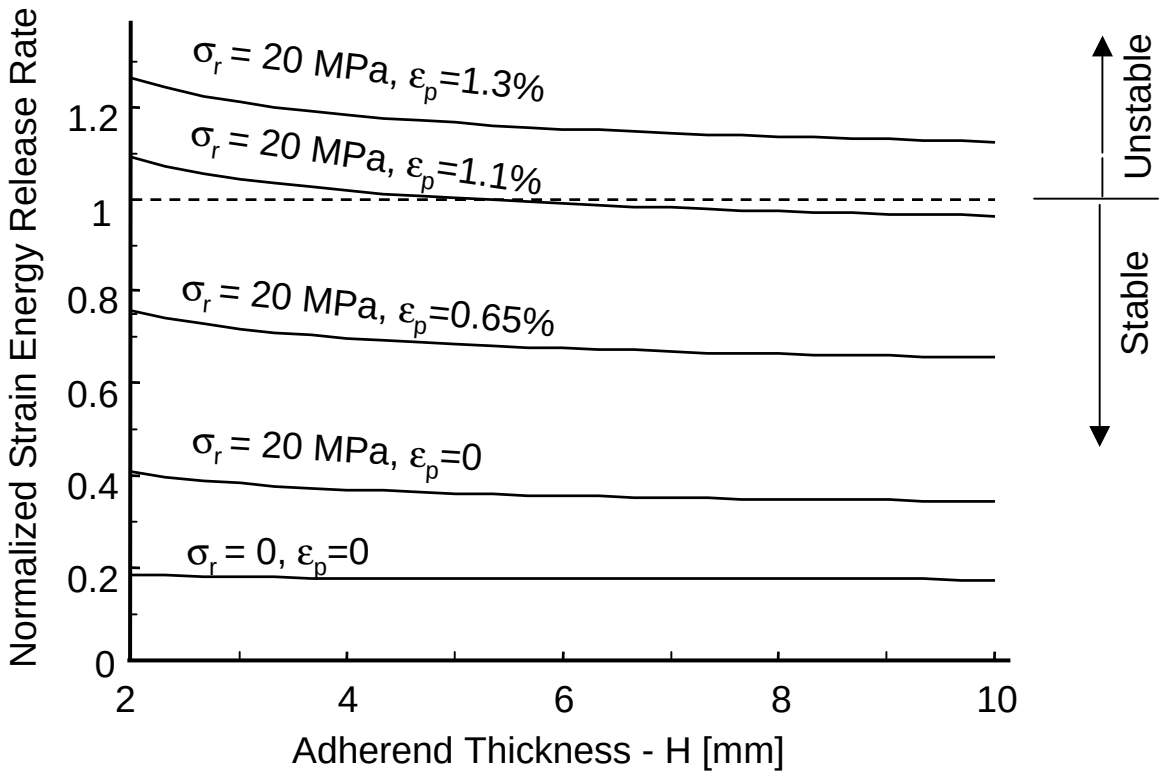

Fig. 1. The directional stability of cracks in DCB specimens predicted using the energy balance model in reference [12]. The strain energy available is normalized to G_c = 310 J/m^2

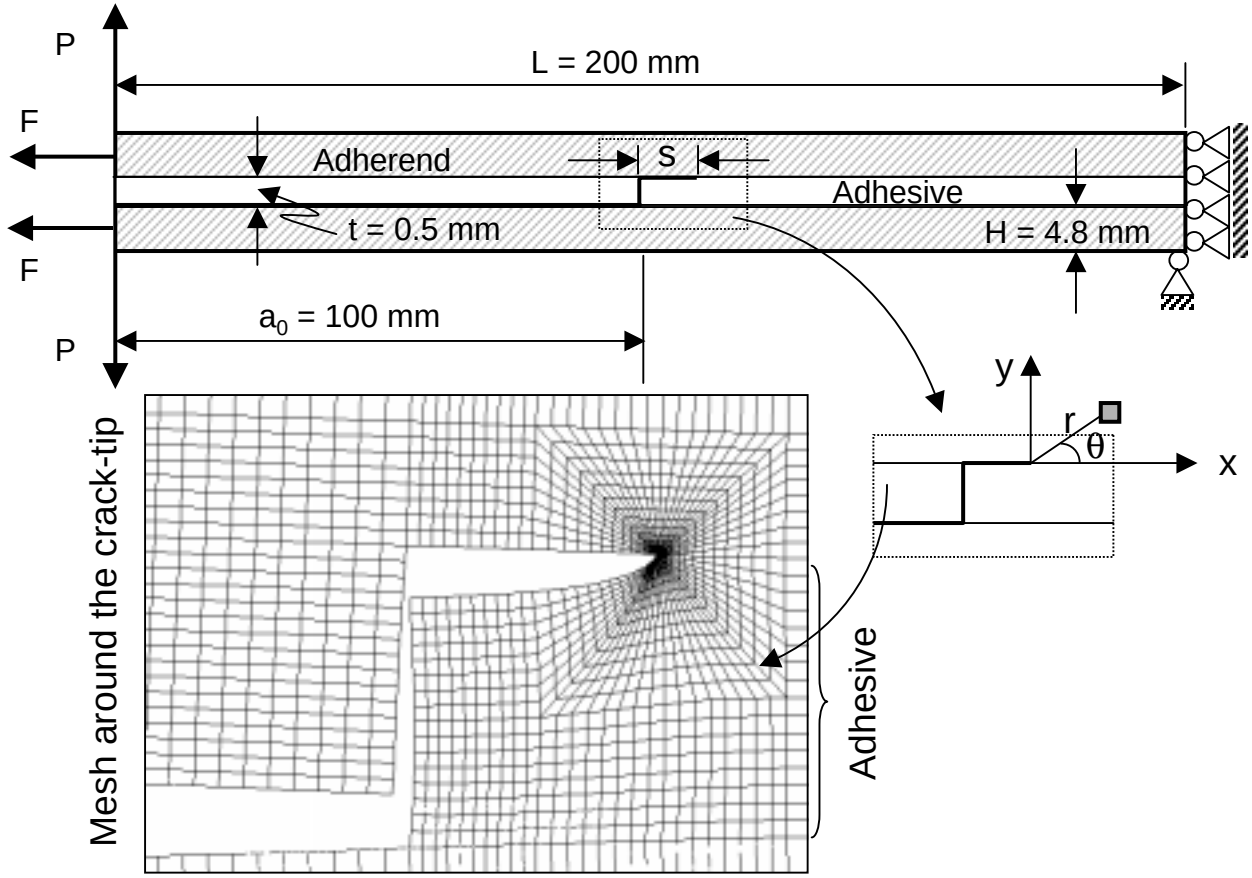

Fig. 2. The DCB specimen geometry used in the finite element analysis to determine the crack propagation behavior after the kinking occurred. The insert is the mesh around the crack-tip.

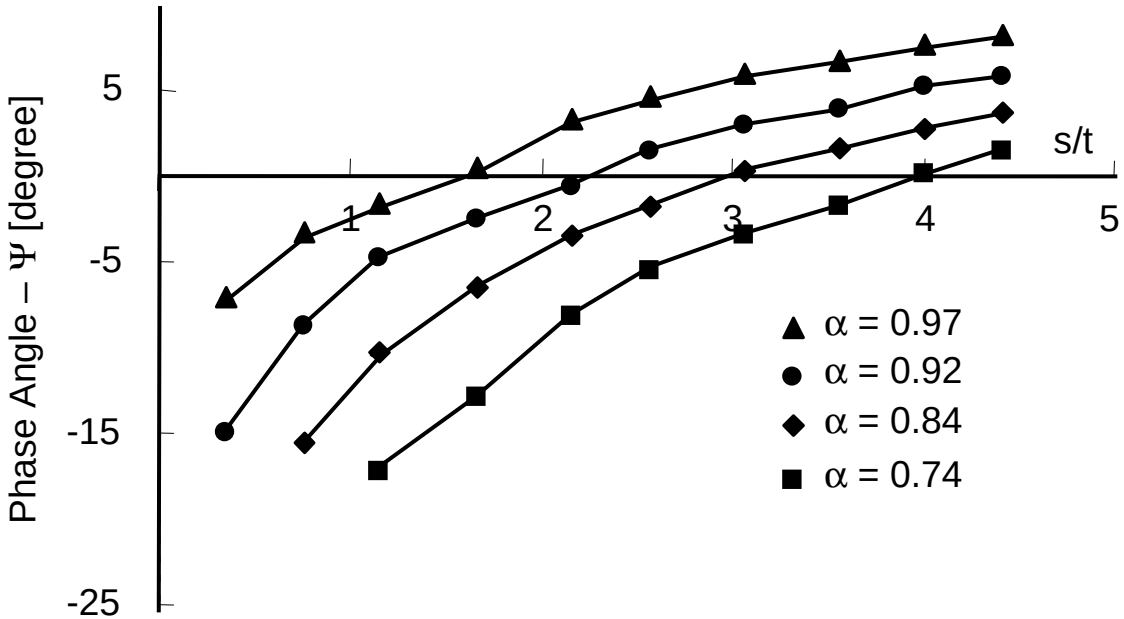

Fig. 3. The phase angle at the crack tip versus the normalized kinked crack length s/t for different materials combinations obtained from the parametric study.

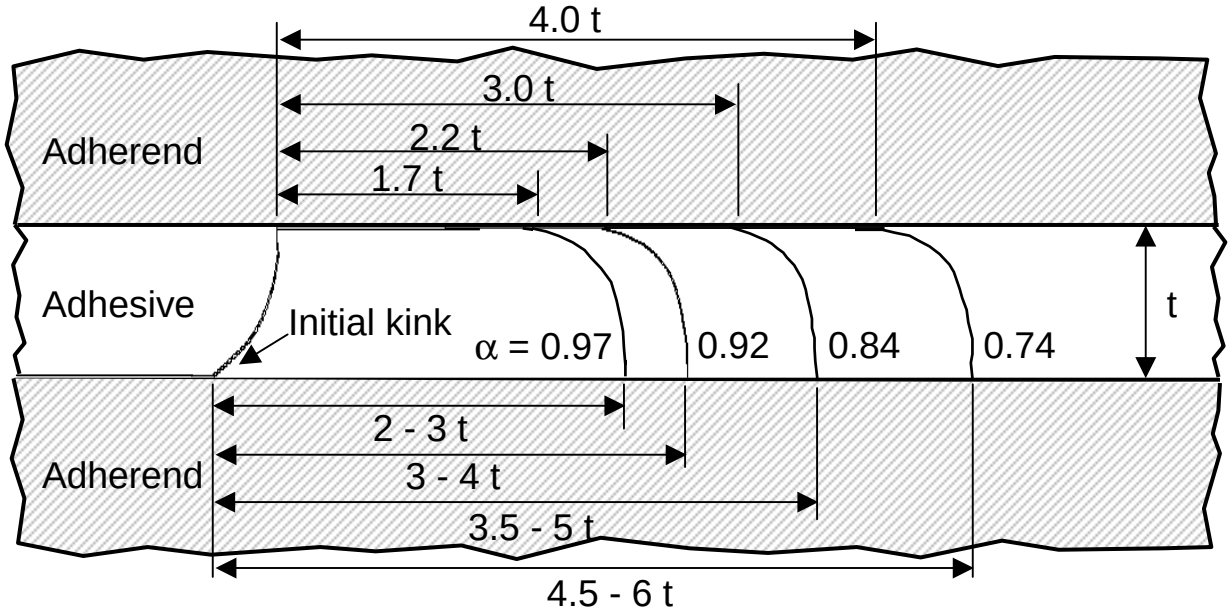

Fig. 4. The crack trajectories of directionally unstable crack propagation for different materials systems predicted using the finite element analysis.

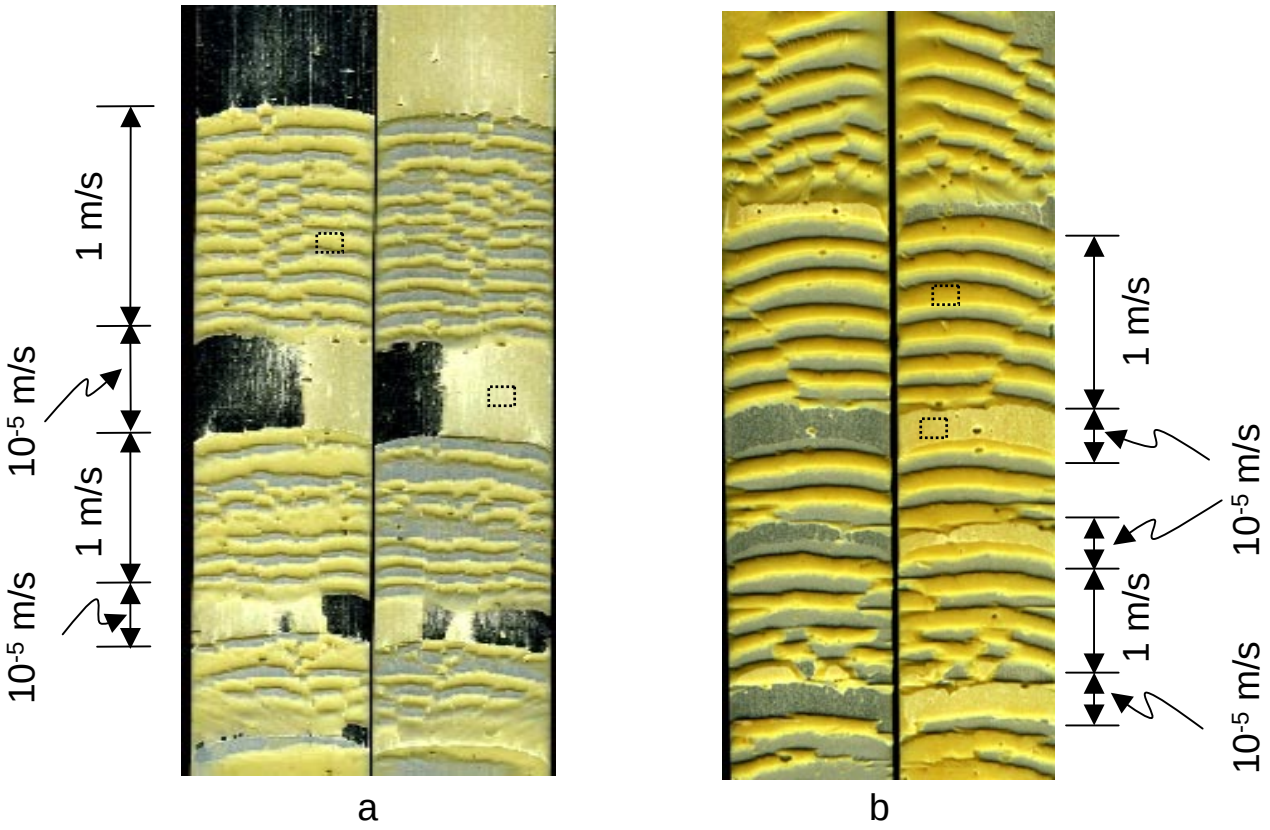

Fig. 5. The failure surfaces of the DCB specimens prepared using acetone wipe (a) and P2 etch (b), respectively. The ⬚ indicates the areas where XPS analyses were conducted.

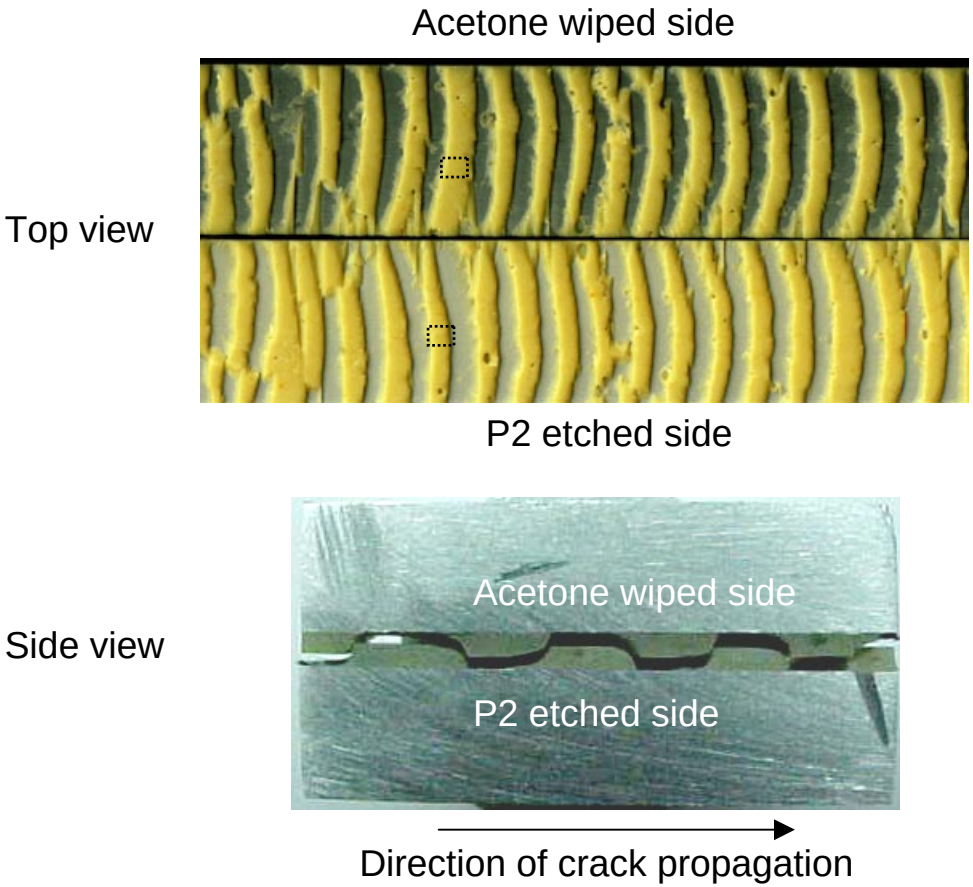

Fig. 6. The failure surfaces and the crack trajectory of the DCB specimen with asymmetric surface preparation. The ⬚ indicates the areas where XPS and Auger analyses were conducted.

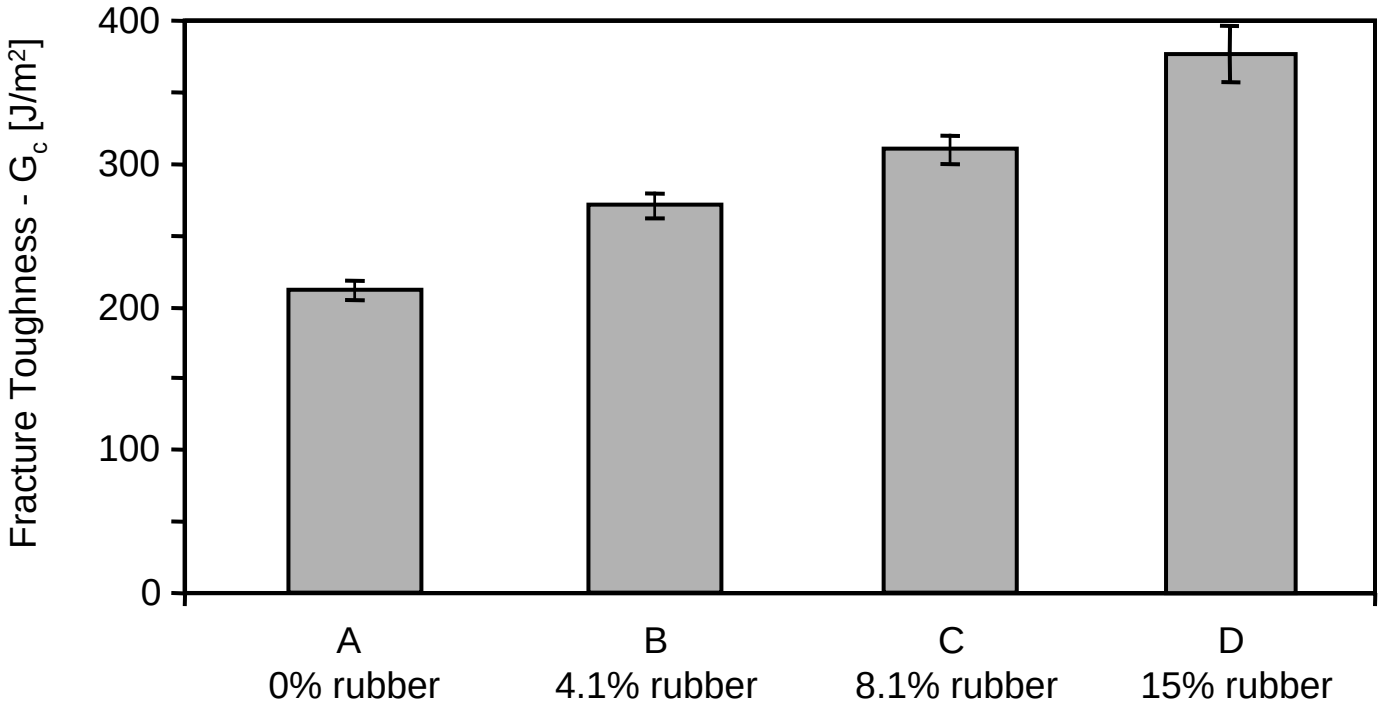

Fig. 7. The fracture toughness of the DCB specimens using adhesives with different levels of rubber concentrations. Error bars represent ± 1 standard deviation.

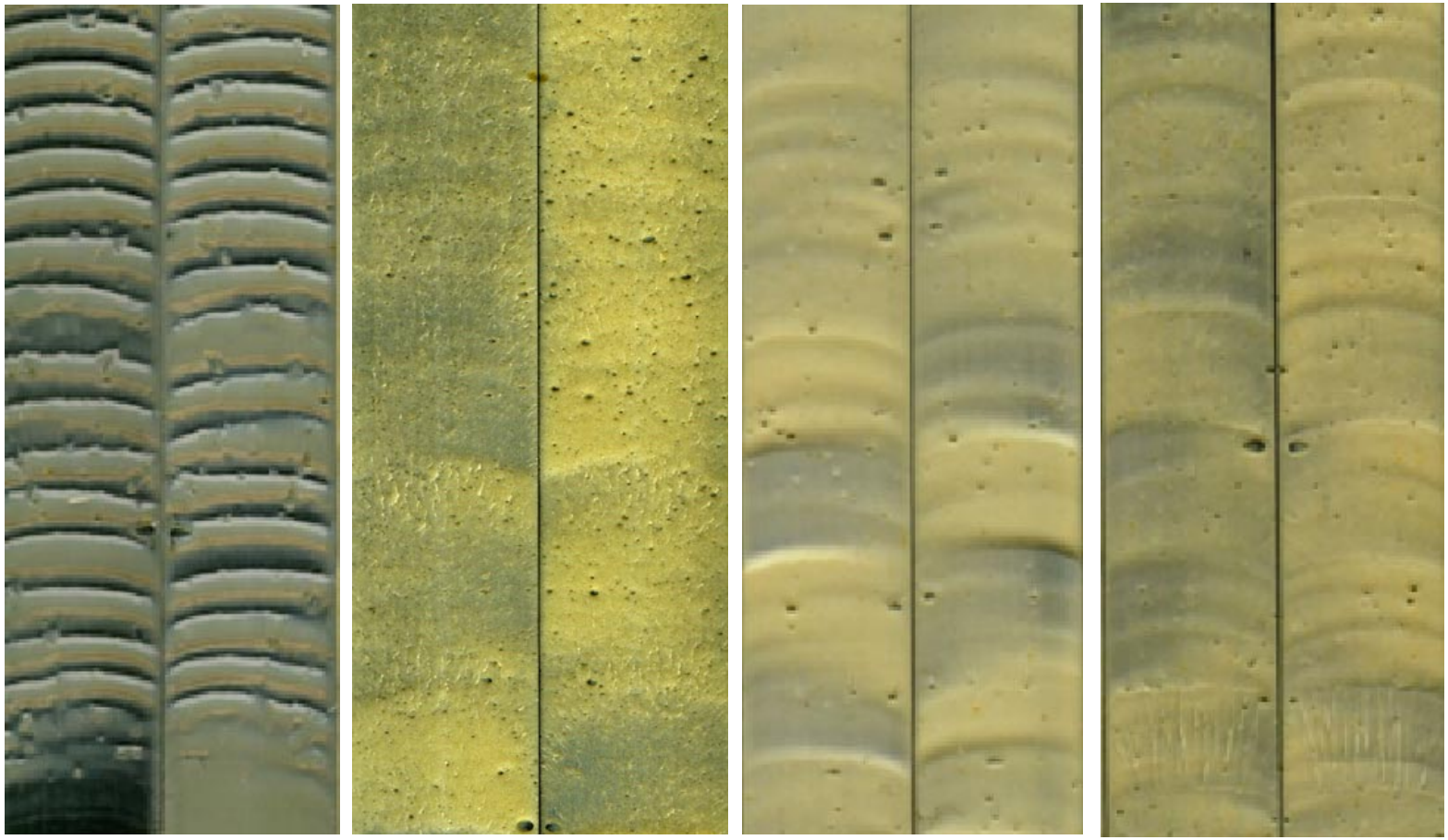

Fig. 8. The failure surfaces of the as-produced DCB specimens prepared using different adhesives.

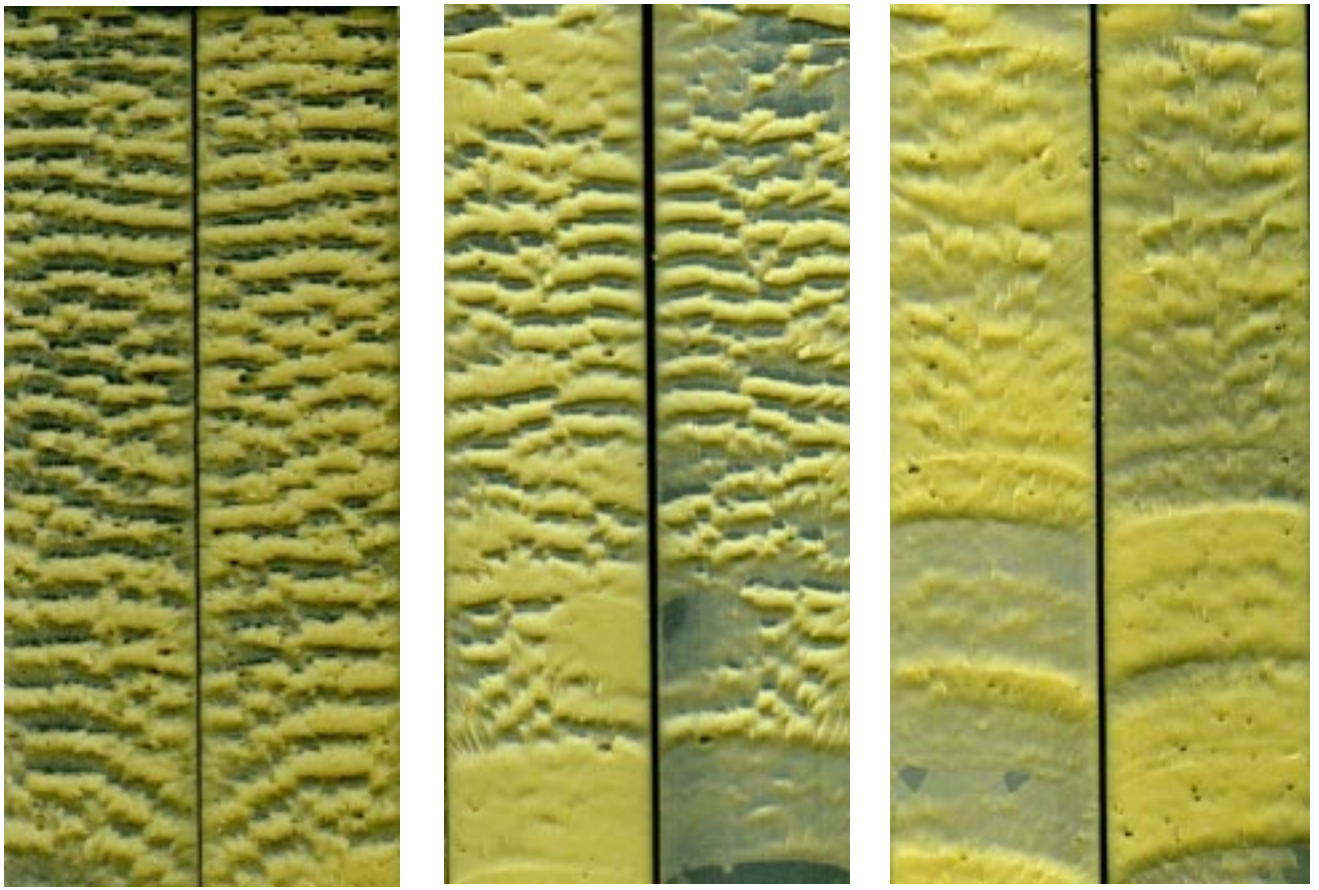

Fig. 9. The failure surfaces of the DCB specimens prepared using different adhesives. All the specimens contained 1.1% plastic deformation in the adherends