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Complementary analytical imaging techniques for the characterization of pretreated carbon fiber reinforced plastics

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Abstract

In this work the complementary characterization of pretreatment techniques for adhesive bonding of carbon fiber reinforced plastics (CFRP) is presented. Industrial CFRP plates were pretreated with laser, plasma and corundum blasting abrasive techniques followed by chemical activation. The combined use of atomic force microscopy and chemical force microscopy enabled the characterization of the surface morphology and the specific adhesion force between a chemically functionalized cantilever and the pretreated surfaces simulating the adhesive bond. Complementary measurements with scanning electrochemical microscopy and X-ray photoelectron spectroscopy supported the experimental findings and delivered additional information about the chemical structure of the surfaces. A comparison of experimental data of