

## Supporting Information

### *Screen effect of CVD graphene over surface free energy of substrates*

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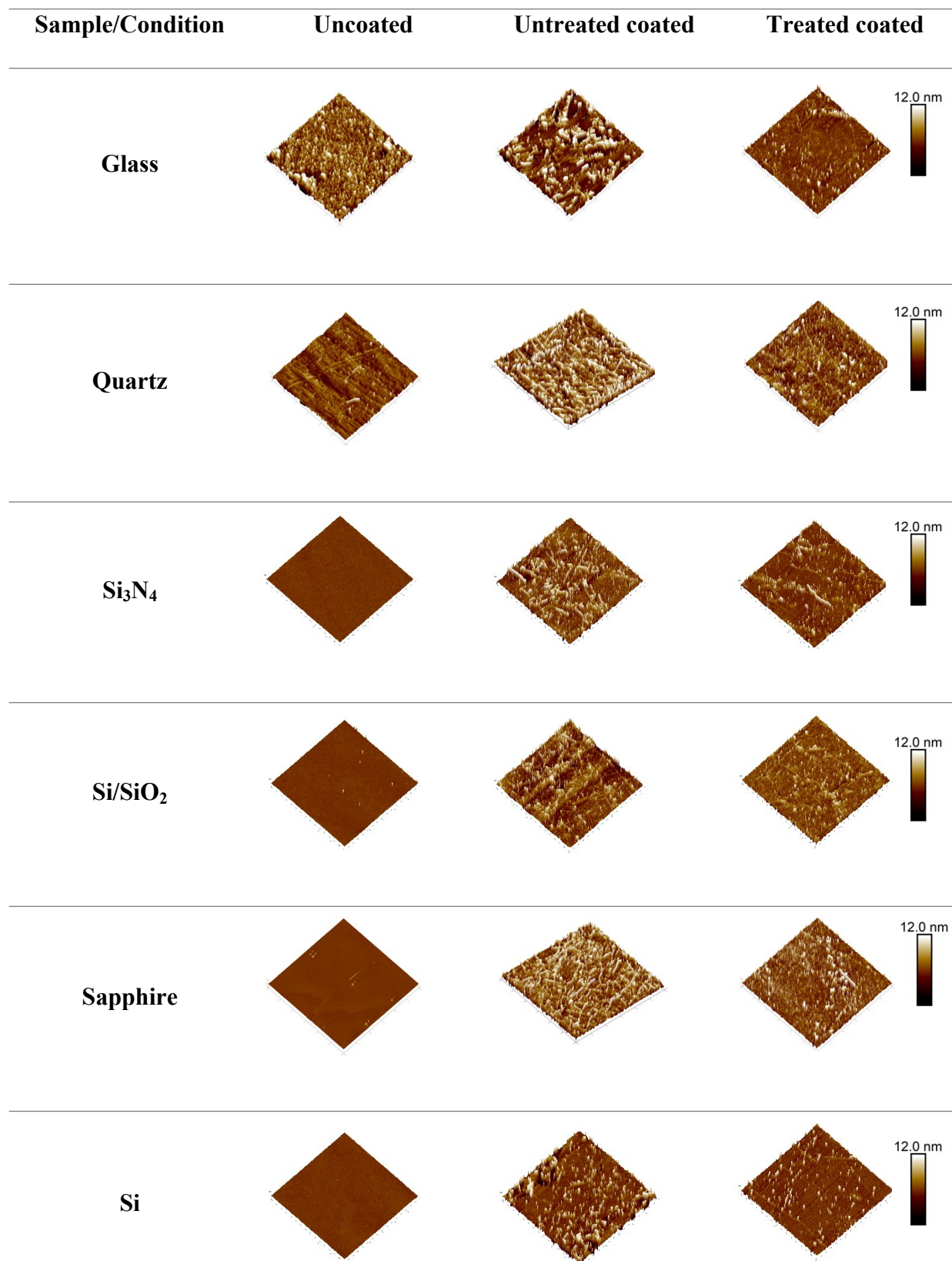
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#### **Atomic force microscopy (AFM) images of uncoated and graphene-coated substrates**

The roughness of uncoated substrates is measured immediately after argon plasma treatment in order to investigate their surface free of contaminants and with no influence of the CVD-Gr coating. The results show that the presence of graphene changes the RMS roughness considerably. Concerning untreated CVD-Gr coated substrates, higher values of RMS roughness are observed, in comparison with treated coated samples, indicating the minor presence of adsorbed hydrocarbons and other air contaminants onto their surfaces. Such decrease in roughness corroborates to the similar decrease in hysteresis after thermal treatment. In **Figure S1** it is shown 3D AFM images related to RMS roughness of uncoated and coated substrates. The latter, includes untreated and thermal treated samples. As the results seen in **Fig. 4**, we also observed different levels of roughness according to each environment condition.



**Figure S1.** 3D AFM images obtained (15  $\mu\text{m}$  x 15  $\mu\text{m}$  area) on the upper surface for untreated uncoated and untreated and treated CVD-Gr coated substrates.