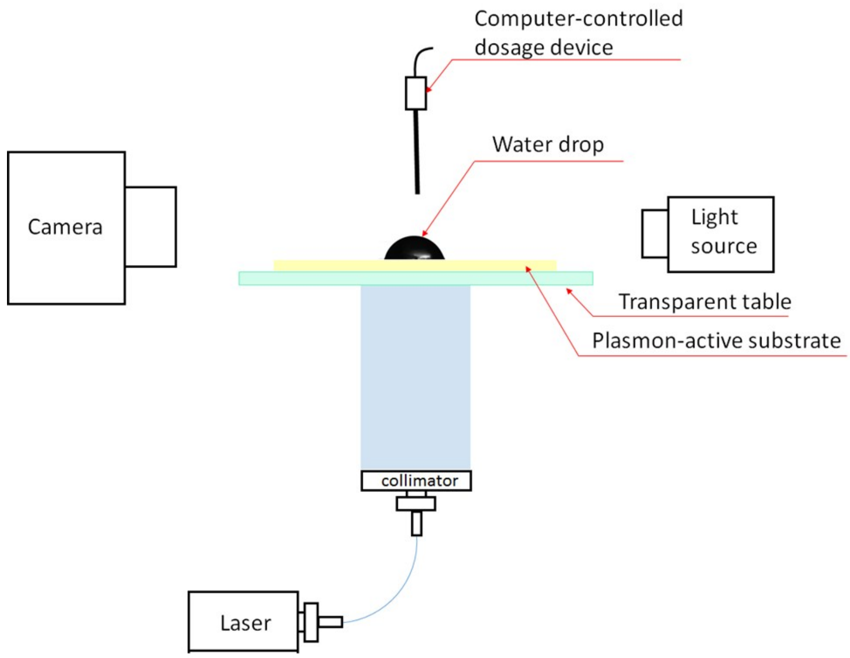

Fig. S1 Schema of experimental set-up for water contact angle illumination assisted measurements.

Optimization of plasmon-supported structure

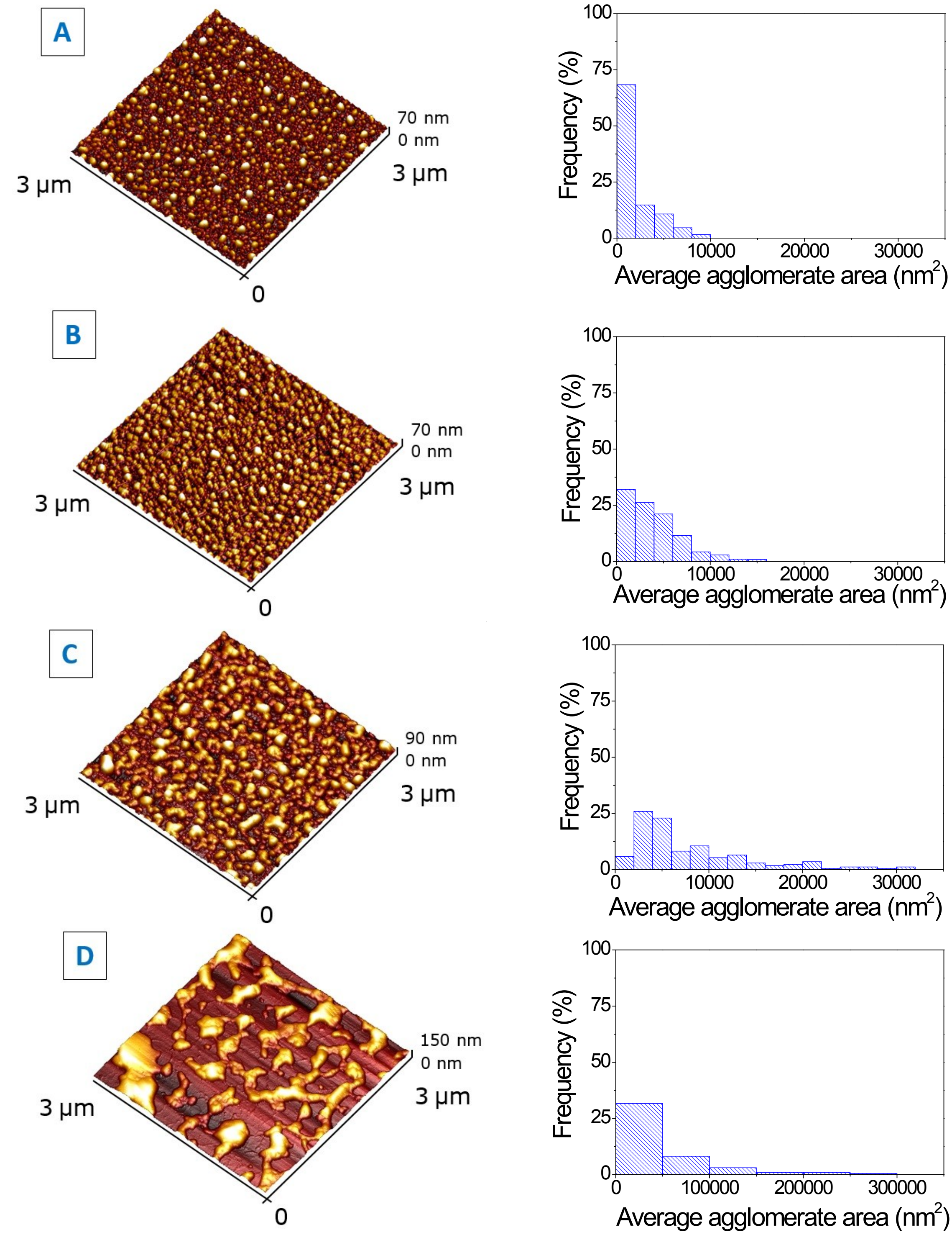

Fig. S2 AFM scans of annealed at 450 °C AgNPs and in argon atmosphere: A – 10 nm layer, B – 15 nm, C – 20 nm, D – 35 nm.

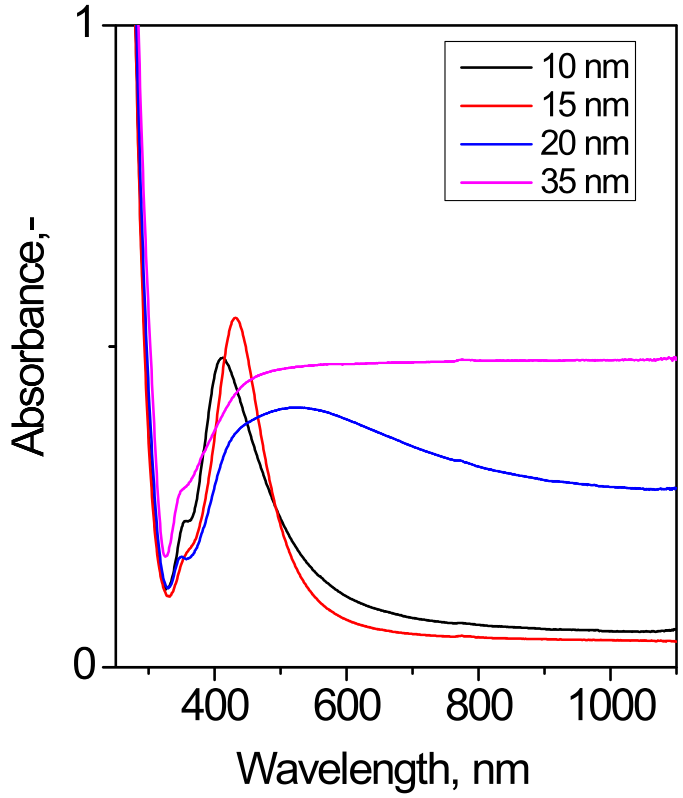

Fig. S3 UV-Vis spectra of annealed at 450 °C AgNPs and in argon atmosphere.

Discussion

To optimize the morphological and optical properties of plasmon supported substrates, the Ag layers with different thicknesses (10, 15, 20, and 35 nm.) were deposited and subsequently annealed. AFM scans on Fig. S2 shows the morphology of created Ag nanocluster arrays. The morphology significantly differs depending on the thickness of the deposited Ag layer (Fig. S2). Furthermore, Fig. S3 presents the corresponding UV-Vis spectra of the annealed samples. As is evident, the annealing of thinner Ag film leads to the formation of well-homogeneous Ag clusters array with pronounced plasmon absorption band (see Fig. S2, Fig. S3). The intensity of plasmon absorption is greater in the case of 15 nm thick initial Ag film (Fig. S3). The annealing of thicker Ag film leads to the formation of less homogeneous film with larger Ag clusters of wider geometry distribution (Fig. S2). Plasmon absorption in these cases becomes less pronounced (20 nm initial Ag thickness) or almost fully disappeared (see the case of 35 nm thick Ag film) – Fig. S3. So, we can conclude that an optimum structure is achieved in the case of 15 nm Ag layer.

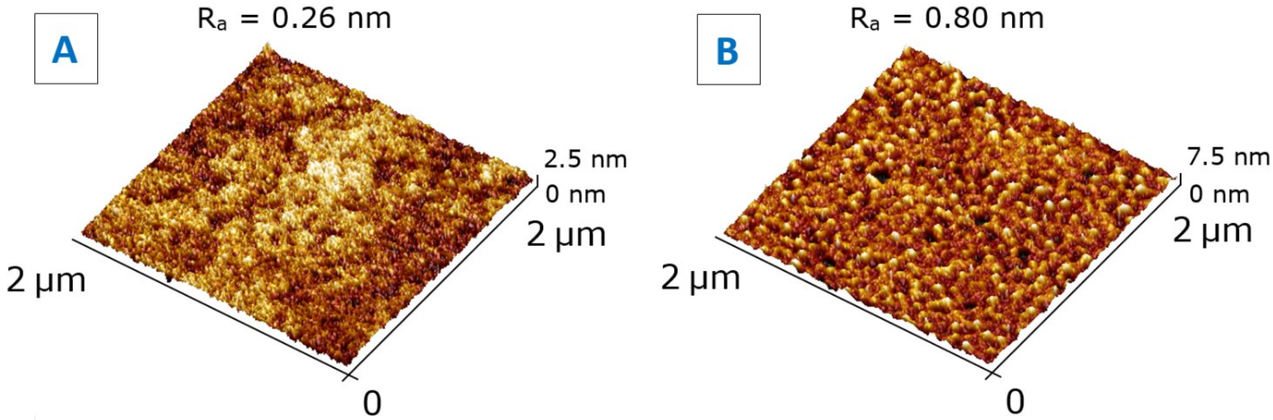

Fig. S4 AFM scans of PS ultrathin film (100 nm) on glass (A) and on Ag substrate after annealing at 450 °C

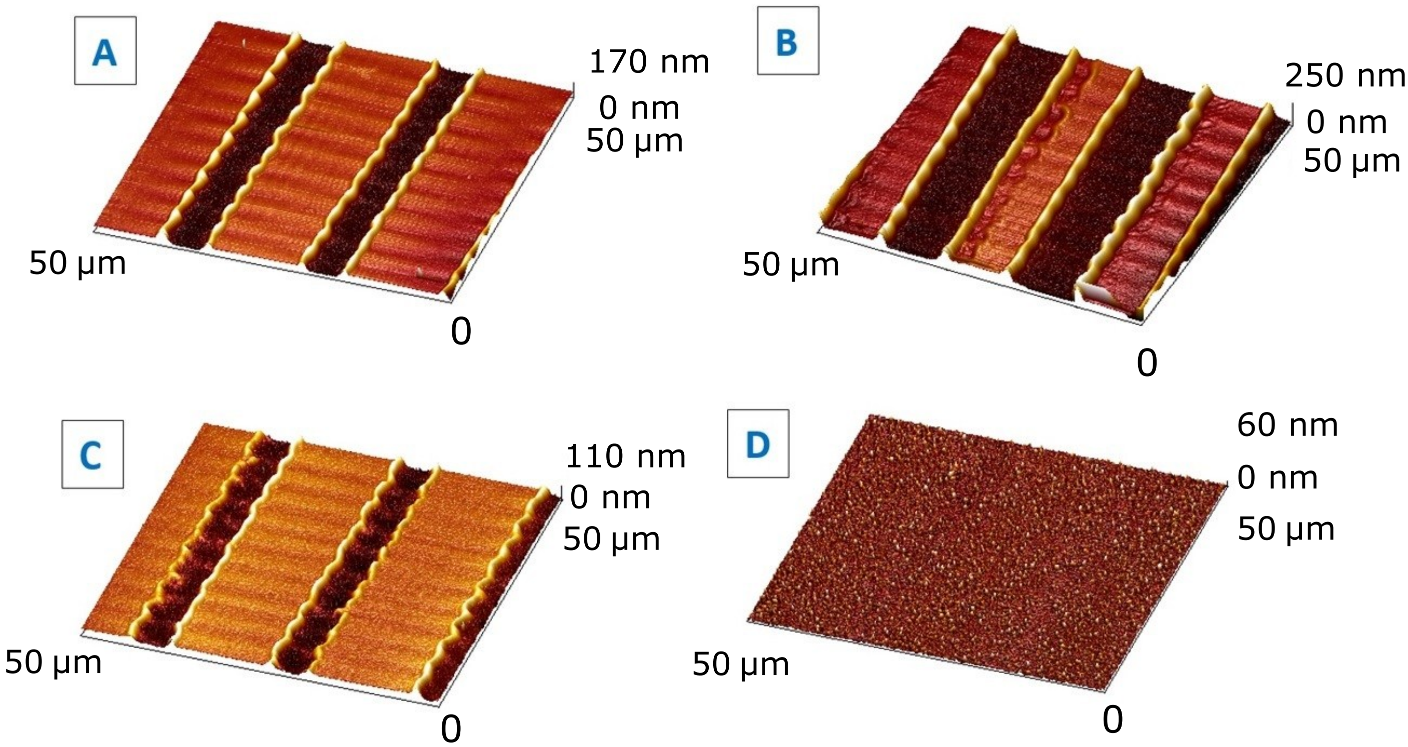

Fig. S5 AFM scans of LBW created structures on different Ag plasmonic substrates: A – 10 nm initial Ag thickness, B – 15 nm, C – 20 nm, D – 35 nm.

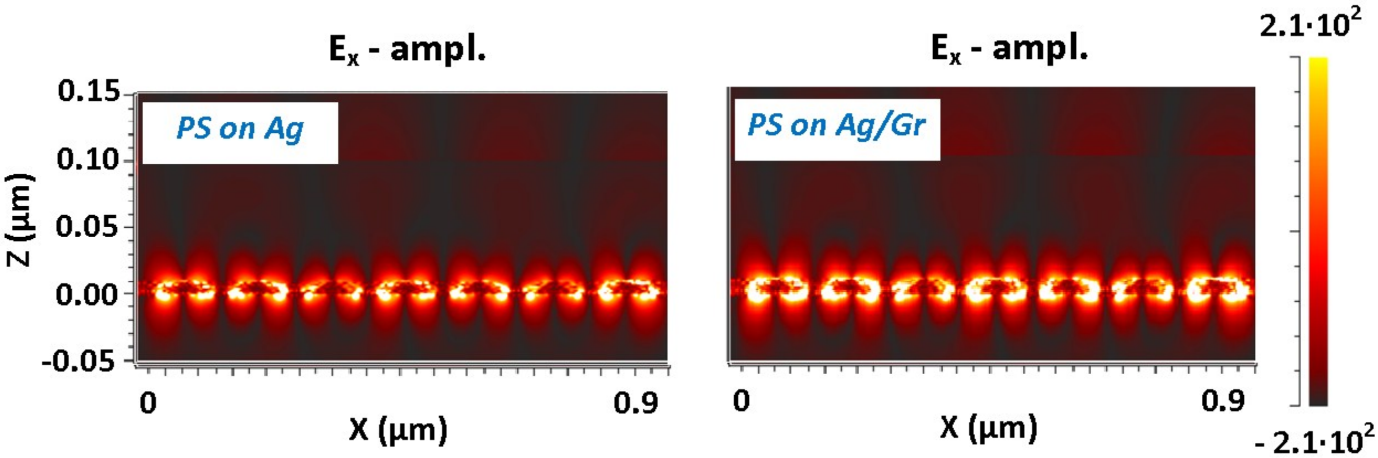

Fig. S6 Electric field distribution on the Ag clusters array, deposited on the glass and graphene substrates and covered by 100 nm thick PS layer.