

## Mapping the local stoichiometry in Cu nanoparticles during controlled oxidation by STEM-EELS spectral images

Eleonora Spurio,<sup>\*a,b</sup> Giovanni Bertoni,<sup>\*a</sup> Sergio D'Addato,<sup>a,b</sup> Francesca Alimonti,<sup>c</sup> and Paola Luches<sup>a</sup>

<sup>\*</sup>These authors contributed equally

<sup>a</sup>CNR - Istituto Nanoscienze, Modena, Italy [eleonoraspurio@unimore.it](mailto:eleonoraspurio@unimore.it), [giovanni.bertoni@cnr.it](mailto:giovanni.bertoni@cnr.it)

<sup>b</sup>Dipartimento FIM, Università degli Studi di Modena e Reggio Emilia, Modena, Italy

<sup>c</sup>Dipartimento di Scienze Chimiche e Geologiche, Università degli Studi di Modena e Reggio Emilia, Modena, Italy

### Effects of UHV annealing on the sample treated by 120 s of plasma

Figure S1 shows the optical absorbance and the AES spectra of the sample after 120 s of plasma exposure and after 30 minutes of subsequent UHV annealing at 773 K. As shown from Figure S1b, the NPs composition is slightly modified by the UHV annealing: the Cu(2) concentration on the sample surface decreases from 54% after the plasma treatment to 22% after the subsequent UHV annealing (the Cu(0) concentration is zero in both cases). The presence of Cu(2) species can also be hypothesized to be responsible for the presence of the double peak in the optical absorbance spectrum after UHV annealing shown in Figure S1a. However, from the absence of LSPR-related features in the optical spectrum in Figure S1a it is possible to exclude the formation of the large NPs that are formed after UHV annealing of the sample treated for 90 s only (Figure 8a in the main text).

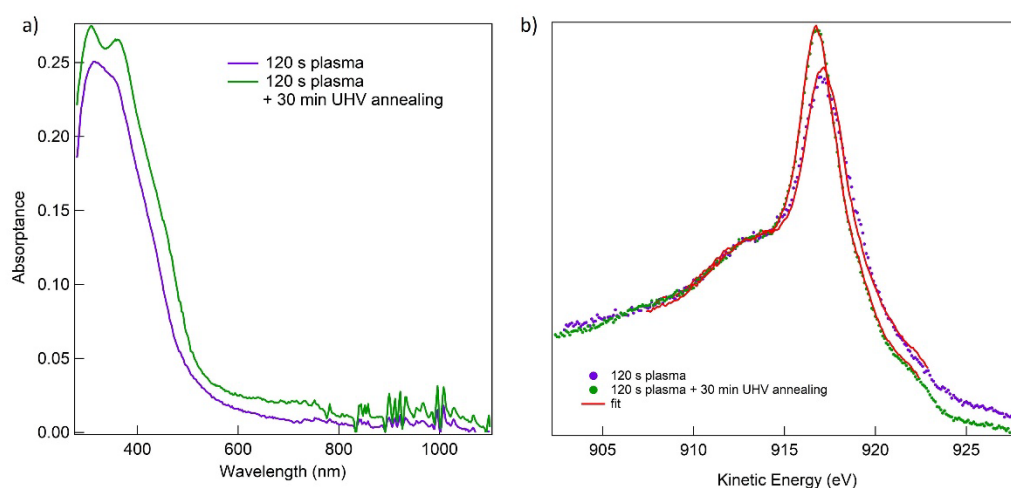


Figure S1 a) Optical absorbance and b) AES spectra with the corresponding fitting of the sample after 120 s of plasma treatment (purple) and after a subsequent UHV annealing (green).