Reviewer 3:

Reviewer comment:

The paper entitled "Green-Graphene protective overlayer on optical microfibers: prolongs the device lifetime" by Novikova et al. presents a method to improve the optical microfibers lifetime. The topic can be of interest, but the overall methodology and results are poorly presented and the conclusions are not supported by the presented results.

Authors' response:

We thank the Reviewer for the vigilance. In the current version of the manuscript, we checked and corrected it.

Reviewer comment:

Moreover the text presents several typos and the method section is repeated in the results section (from row 84 to row 95, page 3 was already written in the 2.2 obtaining composite materials subsection, and from row 155 to row 161 was already written in the 2.1 subsection)

Authors' response:

We thank the Reviewer for the vigilance. In the current version of the manuscript, we checked and corrected it.

Reviewer comment:

Apart from this, the authors do not provide a sounding explanation about why the ratio graphene/gold nanoparticles of 1:3 is the best option: in which terms? It represent the best option in term of quality layer, or in term of increasing the fiber lifetime? For example, a comparison with the higher gold contents is not discussed.

Authors' response:

In this work, we measured different ratios of graphene/gold nanoparticles. In figure 5 we showed that the peak in the case of 1:3 is easily distinguished. In the current version of the manuscript on page 7 line 200, we clarified this and wrote: 'For 1:4, 1:5 and 1:6 concentration, the absorption is slightly increased but with a large amount of gold nanoparticles. Therefore, the optimal ratio for increasing the intensity of the peaks is 1:3, since the peak is quite well pronounced and a large amount of gold nanoparticles is not used.'

Reviewer comment:

Moreover, it is missing a clear label of data reported in figures 4 and 5: for example, in fig 4 c which sample is represented by the blue line and which by the red line? In fig 5c what are sample 1 and sample 2?

Authors' response:

We thank the Reviewer for the vigilance. In the current version of the manuscript, we added a description in figure 4c. Figure 5c shows the spectra of different concentrations of graphene and gold nanoparticles which are zoomed in later in figure 5d for distinguishing between each concentration.

Reviewer comment:

Finally, the claim at page 7, row 193: "Since it is known that this microfibers fast to brake when in contact with metals and caustic substances in water[49,50], we investigated their lifetime with gold nanoparticles deposited on them while stabilised graphene films. When applying gold nanoparticles with a diameter of 30 nm, the lifetime of the microfiber is 7 seconds. When graphene and gold nanoparticles were applied to microfiber, the microfiber lifetime was increased to 32 seconds. The experiment was repeated with concentrations of graphene to gold 1:1 1:2, 1:3, 1:4 1:5 and 1:6 in several repetitions. From the data obtained, we conclude that the presence of graphene films on the surface of microfiber increases its lifetime times 4.57." is not supported by any experimental figures or data, nor a description of the experimental method to measure the microfiber lifetime.

Authors' response:

We thank the Reviewer for the vigilance. In the current version of the manuscript on page 7 line 216 we clarified this and wrote: 'We applied 6 micro liters of different concentrations of gold nanoparticles on the microfiber region of the tapered fiber. We calculated the lifetime by measuring the transmission of the tapered fiber until the microfiber completely ruptured which caused the transmission to become zero. With a series of samples of graphene composites and gold nanoparticles, we performed the same procedure and measured the operating time of the microfiber until destruction.' On page 7 line 225 we clarified this and wrote: ' Regardless of the concentrations of gold, the lifetime of microfiber was the same, most likely since the concentration of graphene films in all samples was the same.'