**SUPPLEMENTARY MATERIALS**

# Photoremoval of Bisphenol a Using Hierarchical Zeolites and Diatom Biosilica

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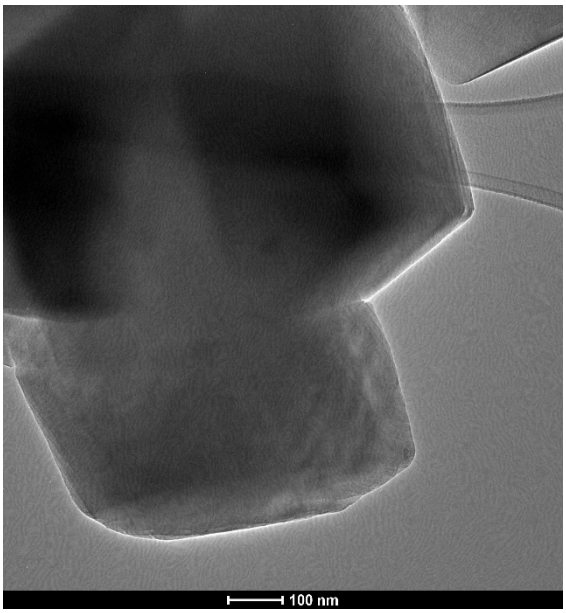
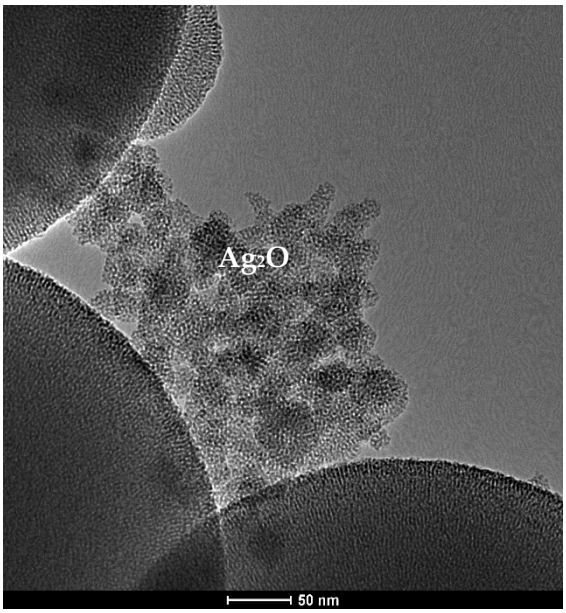
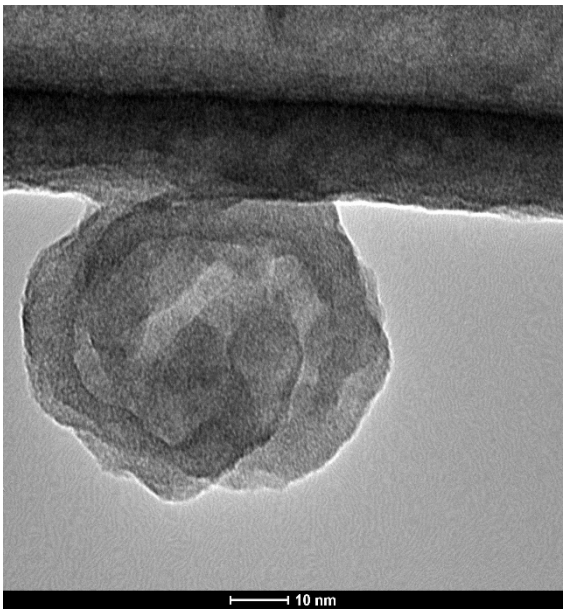



**Commercial zeolite (FAU)**




**Zeolite FAU_CTABr_3%AgNO3**




**Zeolite FAU_CTABr_Ru**

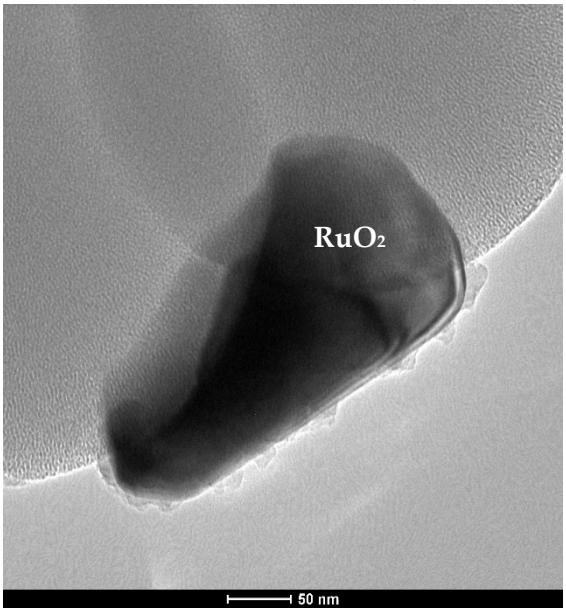



**Figure S1.** Transmission electron microscopy (TEM) images.

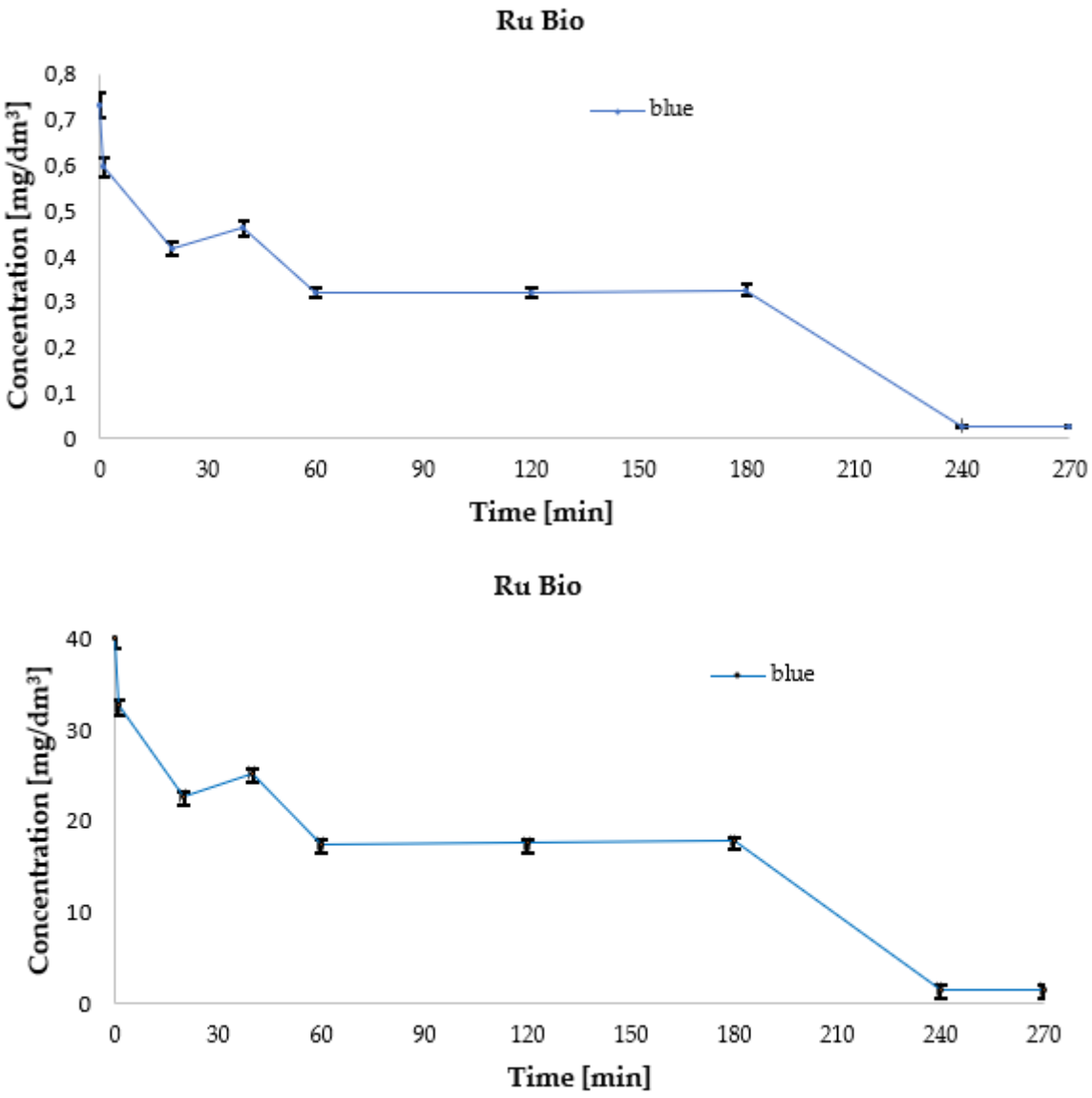



**Figure S2.** Time dependence of absorbance/concentration for 40 mg/dm$^3$ bisphenol A solutions under blue light irradiation at 25 °C, pH 7 in the presence of ruthenium ion- modified biosilica.

**Photocatalytic removal of bisphenol A using a hierarchical zeolite based on FAU-type commercial zeolite modified with ruthenium ions**

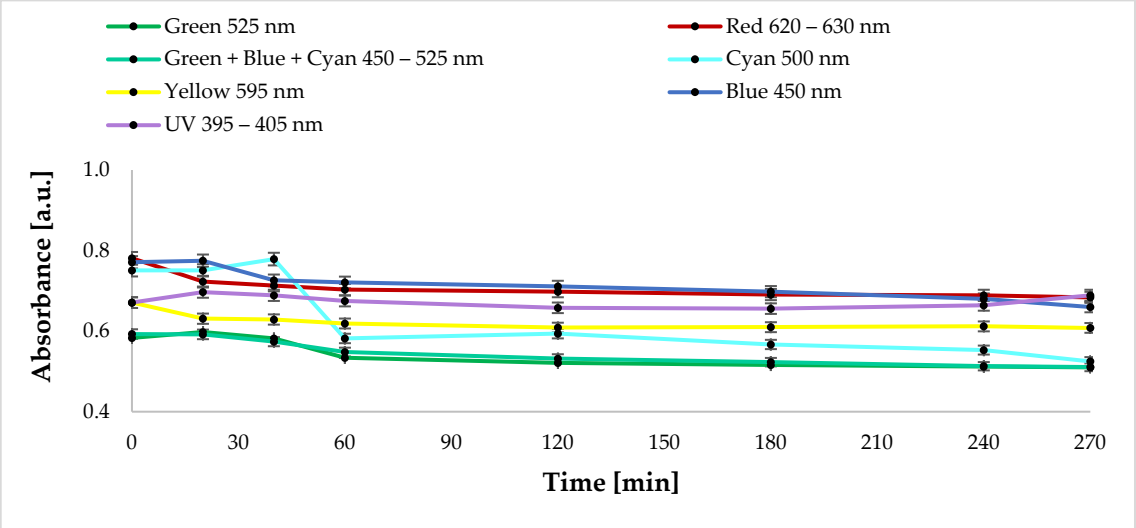



**Figure S3.** Time dependence of absorbance for 40 mg/dm$^3$ bisphenol A solutions under light irradiation at 25 °C, pH 7 using a hierarchical zeolite based on FAU-type commercial zeolite modified with ruthenium ions.

**Photocatalytic removal of bisphenol A using a hierarchical zeolite based on FAU-type commercial zeolite modified with silver ions**

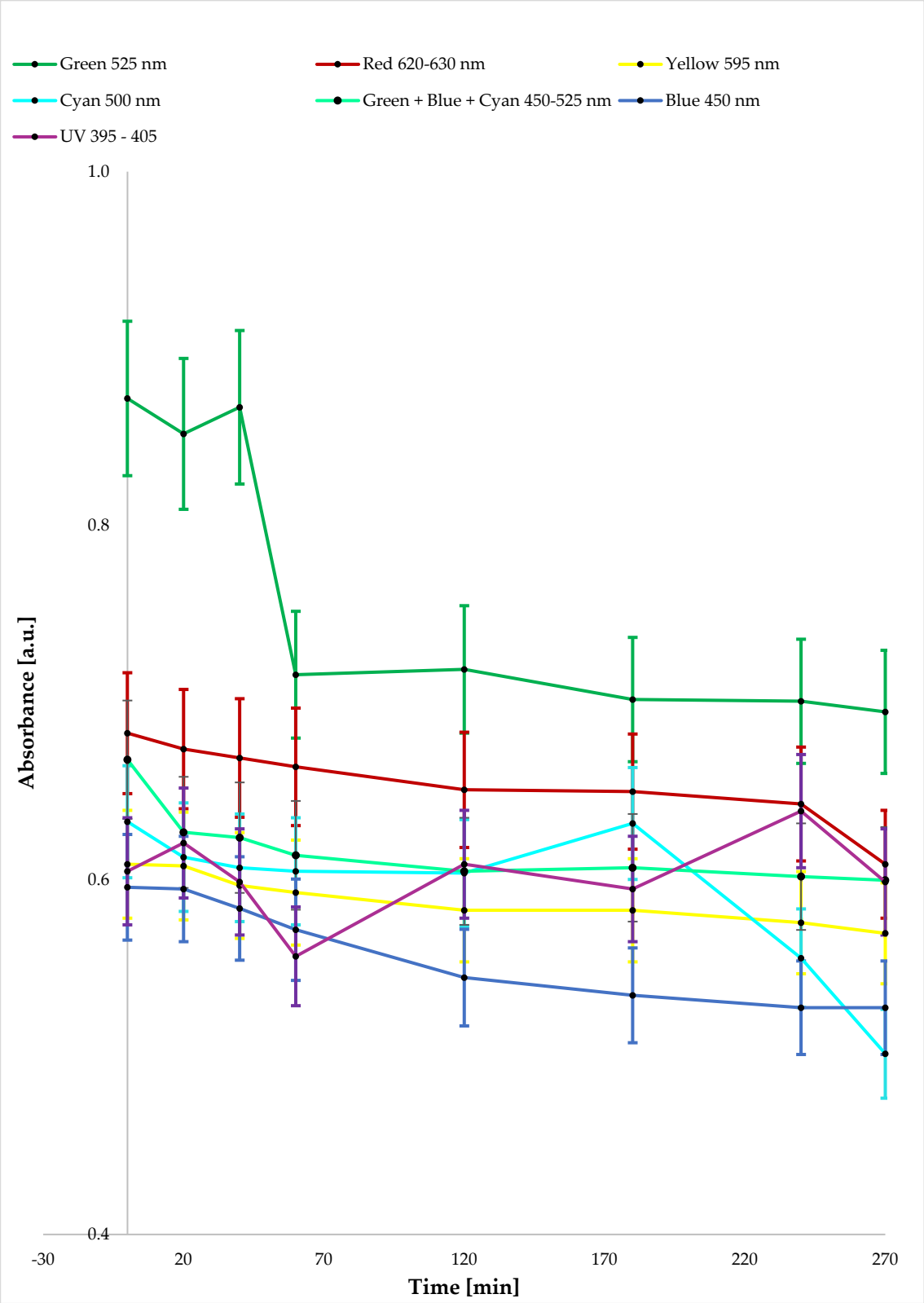



**Figure S4.** Time dependence of absorbance for 40 mg/dm$^3$ bisphenol A solutions under light irradiation at 25 °C, pH 7 using a hierarchical zeolite based on FAU-type commercial zeolite modified with silver ions.

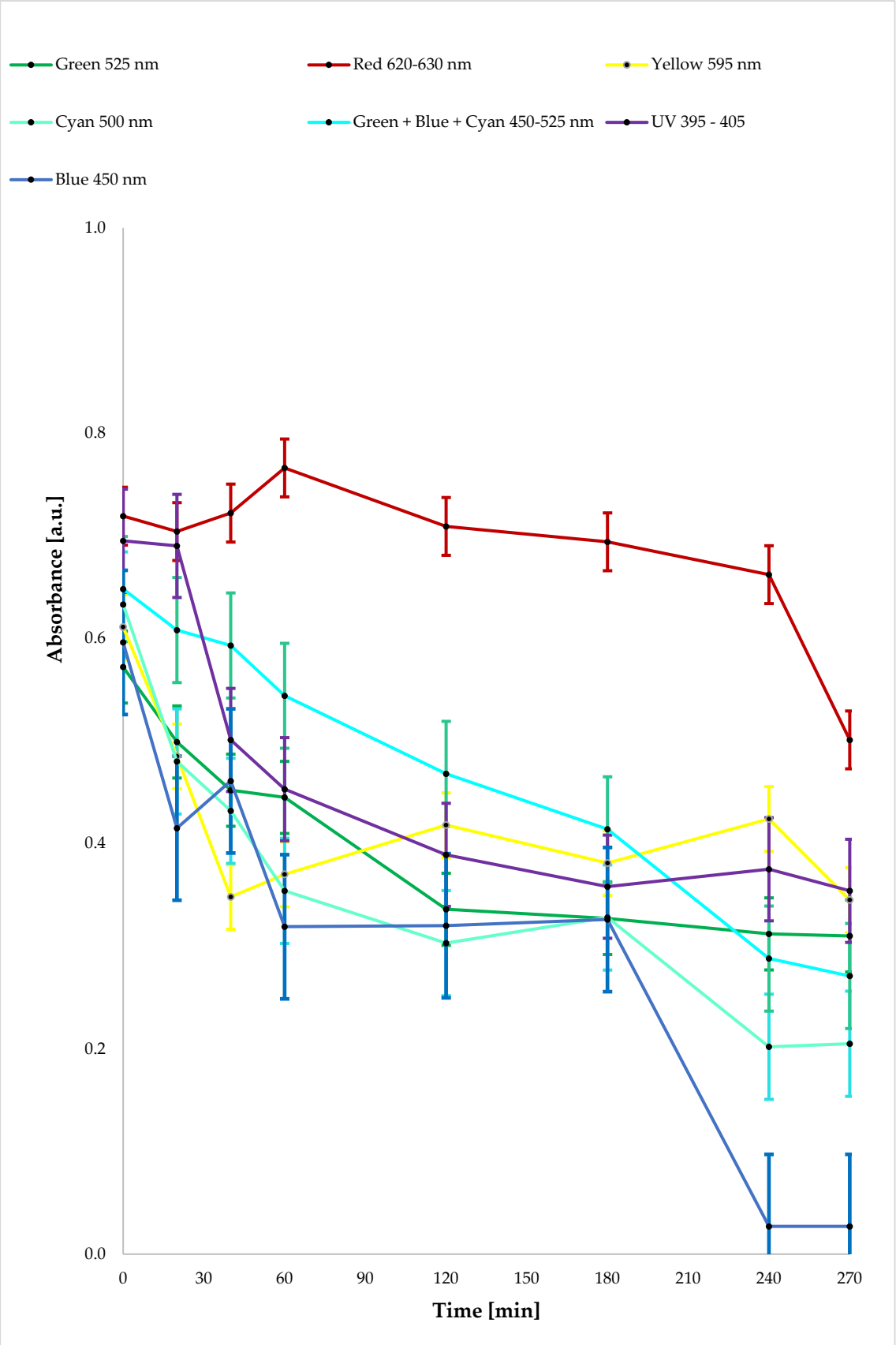



**Figure S5.** Time dependence of absorbance for 40 mg/dm$^3$ bisphenol A solutions under light irradiation at 25 °C, pH 7 using biosilica modified with ruthenium ions.

## Photocatalytic removal of bisphenol A using biosilica modified with silver ions

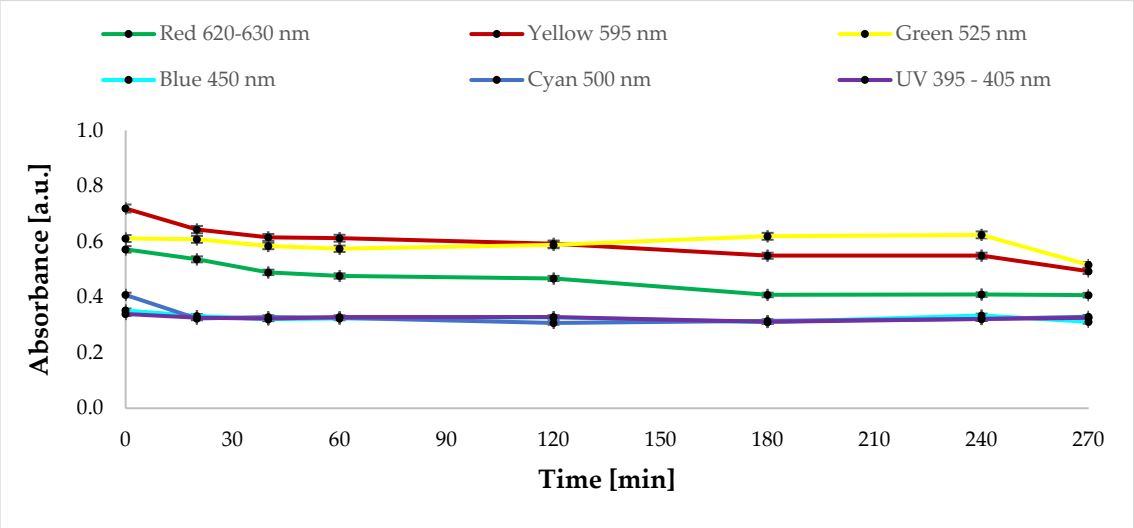



**Figure S6.** Time dependence of absorbance for 40 mg/dm³ bisphenol A solutions under light irradiation at 25 °C, pH 7 using biosilica modified with silver ions.

## Photocatalytic removal of bisphenol A using biosilica (bio-$SiO_2$)

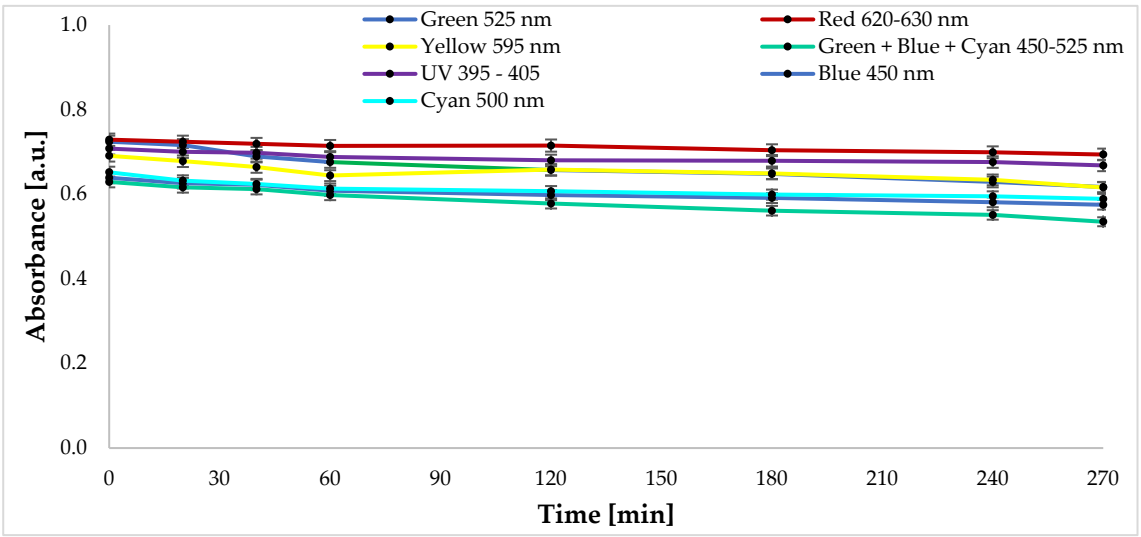



**Figure S7.** Time dependence of absorbance for 40 mg/dm³ bisphenol A solutions under blue light irradiation at 25 °C, pH 7 using biosilica.

## Photocatalytic removal of bisphenol A using commercial zeolite - FAU

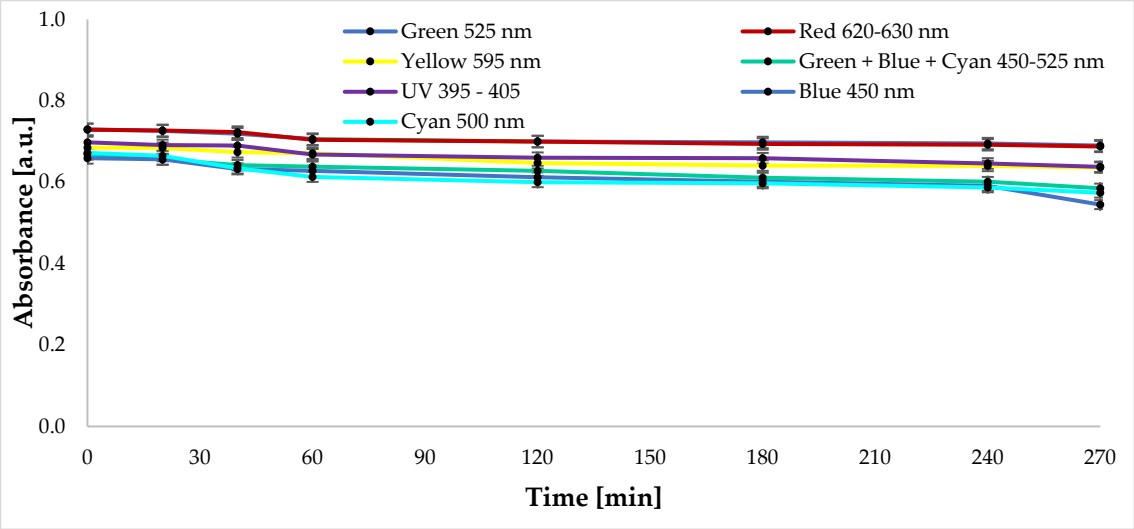



**Figure S8.** Time dependence of absorbance for 40 mg/dm$^3$ bisphenol A solutions under light irradiation at 25 °C, pH 7 using commercial zeolite – FAU.

## Photocatalytic removal of bisphenol A without catalyst - blank

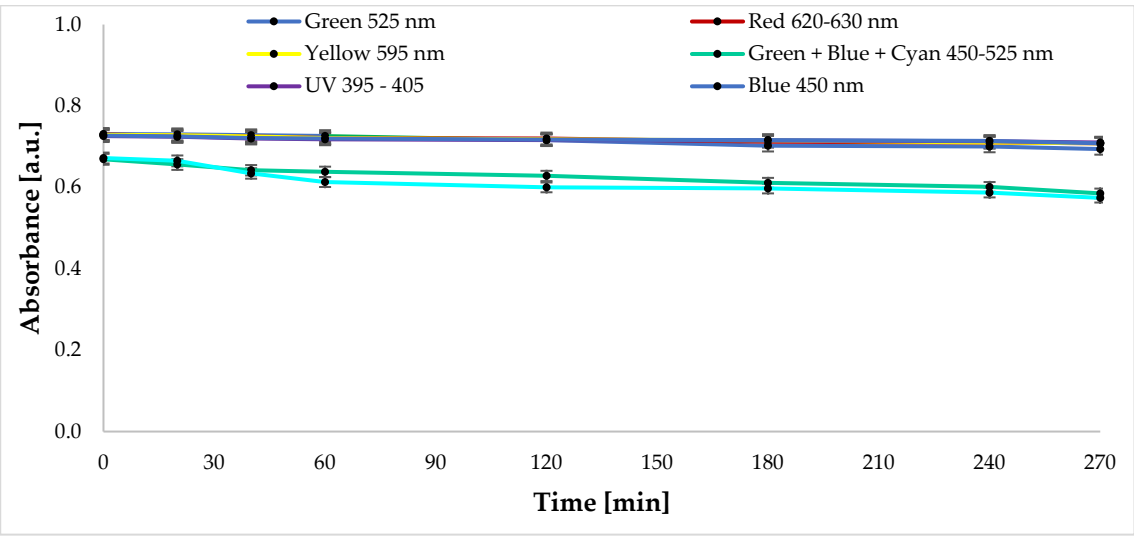



**Figure S9.** Time dependence of absorbance for 40 mg/dm$^3$ bisphenol A solutions under blue light irradiation at 25 °C, pH 7 without catalyst (blank).

## Leaching tests

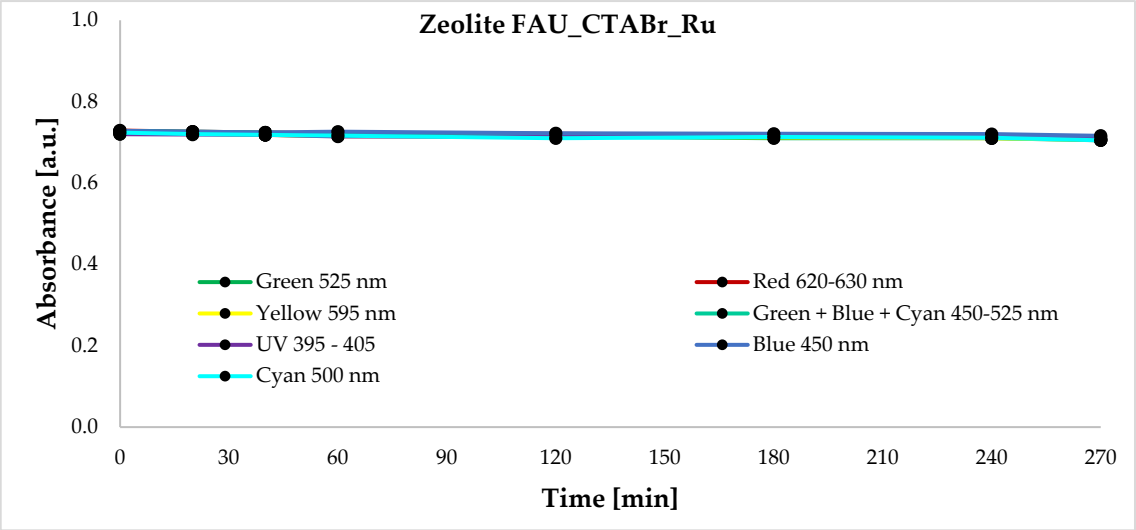



**Figure S10.** Leaching test – Zeolite FAU_CTABr_Ru; T = 25 °C; pH 7.

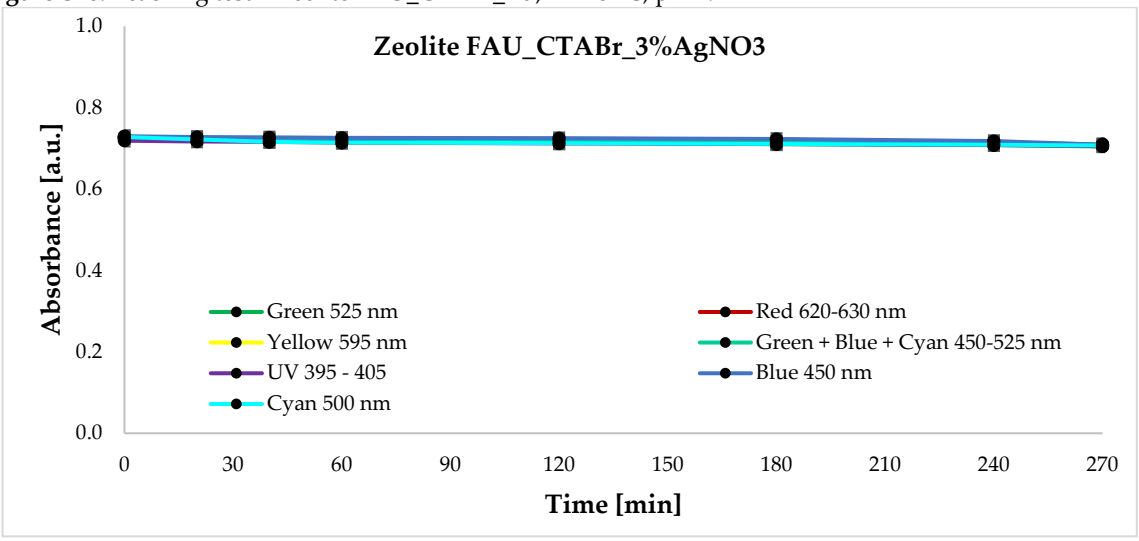



**Figure S11.** Leaching test – Zeolite FAU_CTABr_3%AgNO3; T = 25 °C; pH 7.

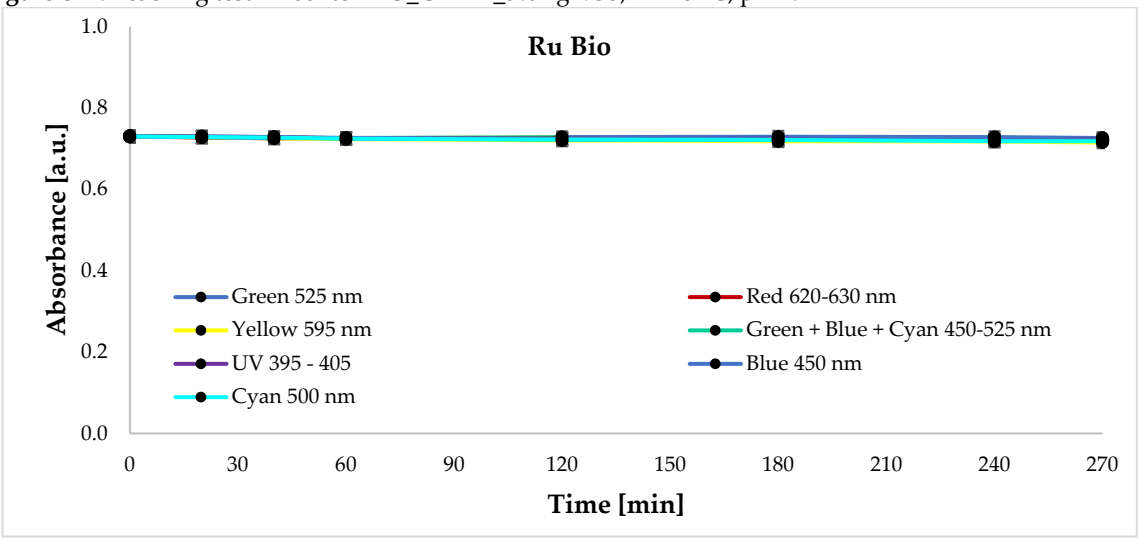



**Figure S12.** Leaching test – Ru Bio; T = 25 °C; pH 7.

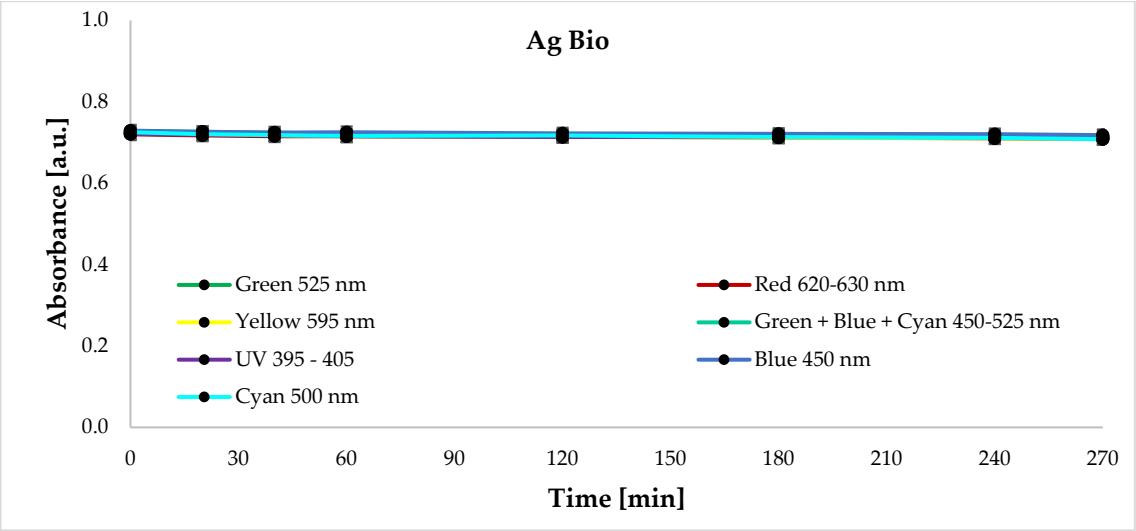



**Figure S13.** Leaching test – Ag Bio; T = 25 °C; pH 7.

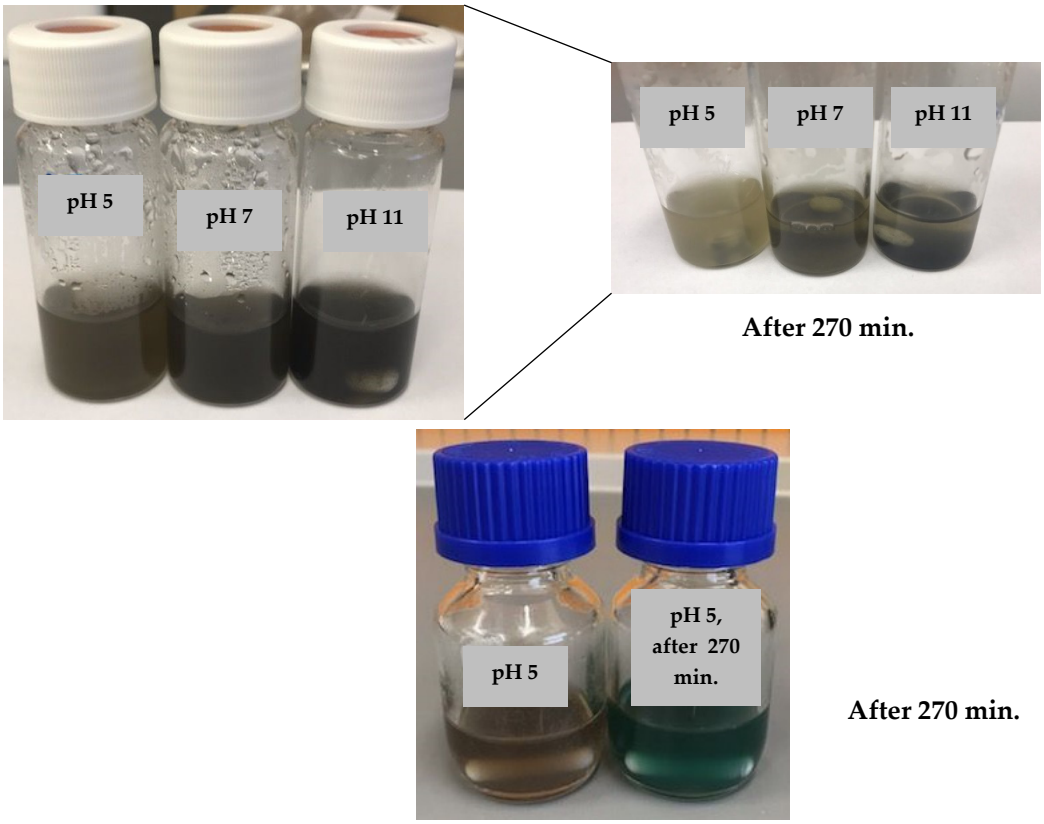



**Figure S14.** Effect pH on the photocatalytic **removal** of bisphenol A for ruthenium ion-modified diatom biosilica - Color change of bisphenol solution over time (T = 25 °C; green+blue+cyan light irradiation, at different solution pH values).

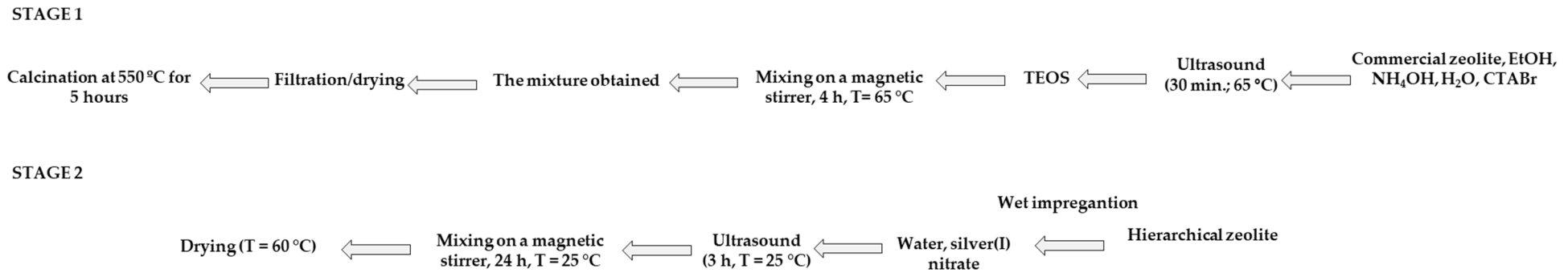



**Figure S15.** Synthesis of hierarchical zeolites based on FAU-type commercial zeolite modified with silver ions.

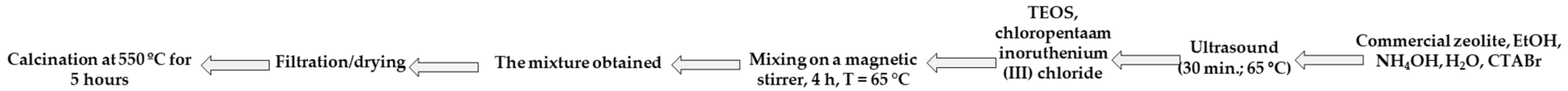



**Figure S16.** Synthesis of hierarchical zeolites based on FAU-type commercial zeolite modified with ruthenium ions.

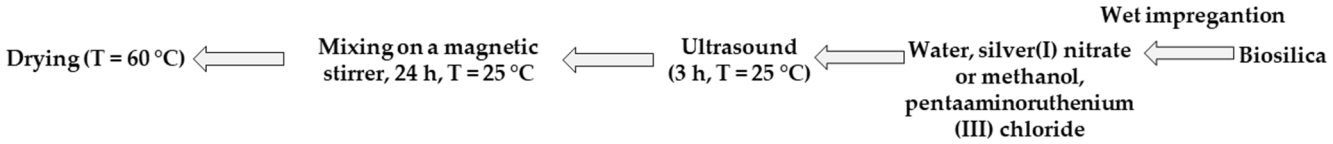
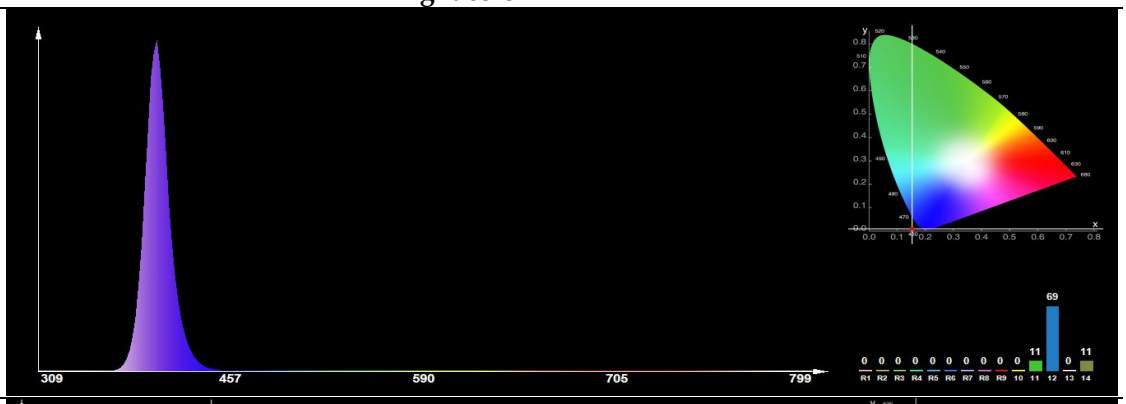
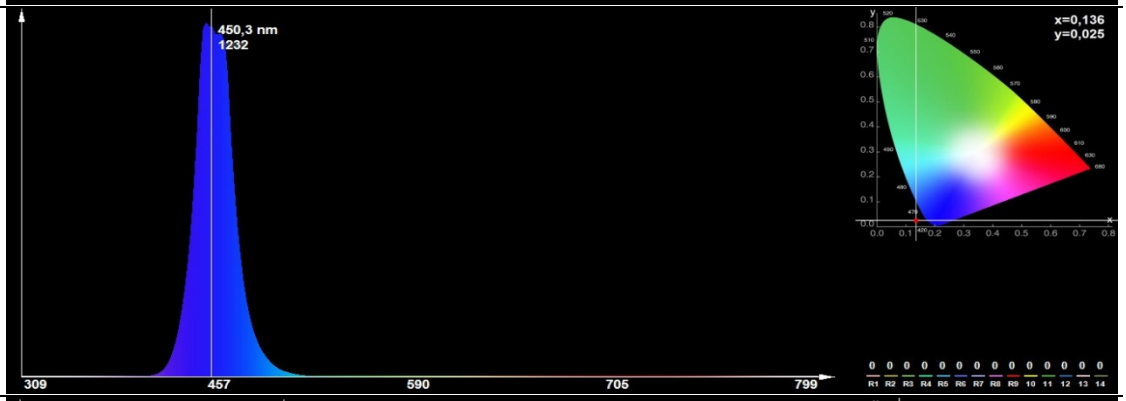
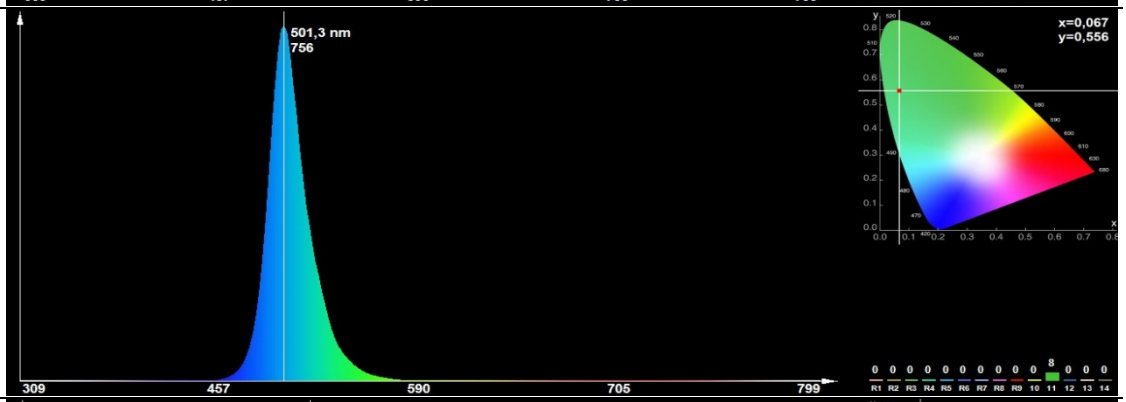
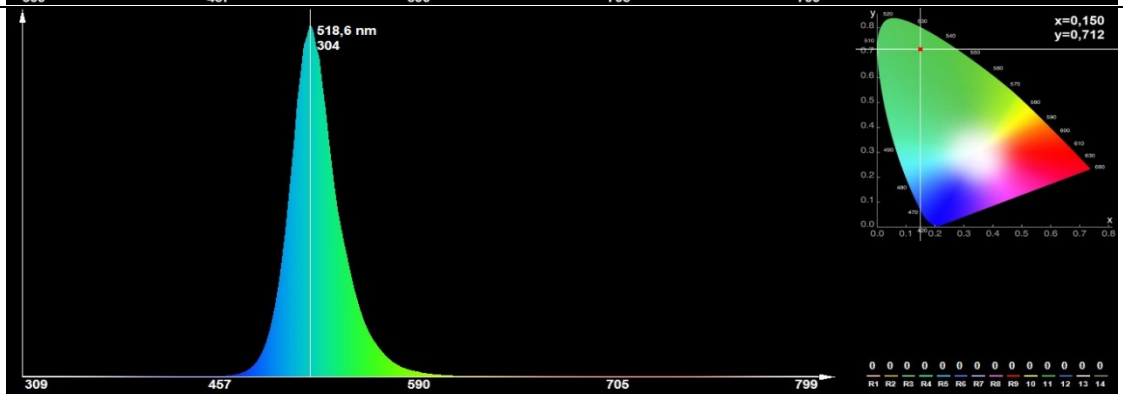



**Figure S17.** Synthesis of biosilica modified with silver ions or ruthenium ions.

## Emission spectra of monochromatic light sources

| Light color | |
|---|---|
| **UV**<br>**395 – 405 nm** |  |
| **Blue**<br>**450 nm** |  |
| **Cyan**<br>**500 nm** |  |
| **Green**<br>**525 nm** |  |

**Yellow**
**595 nm**

**Red**
**620 - 630**

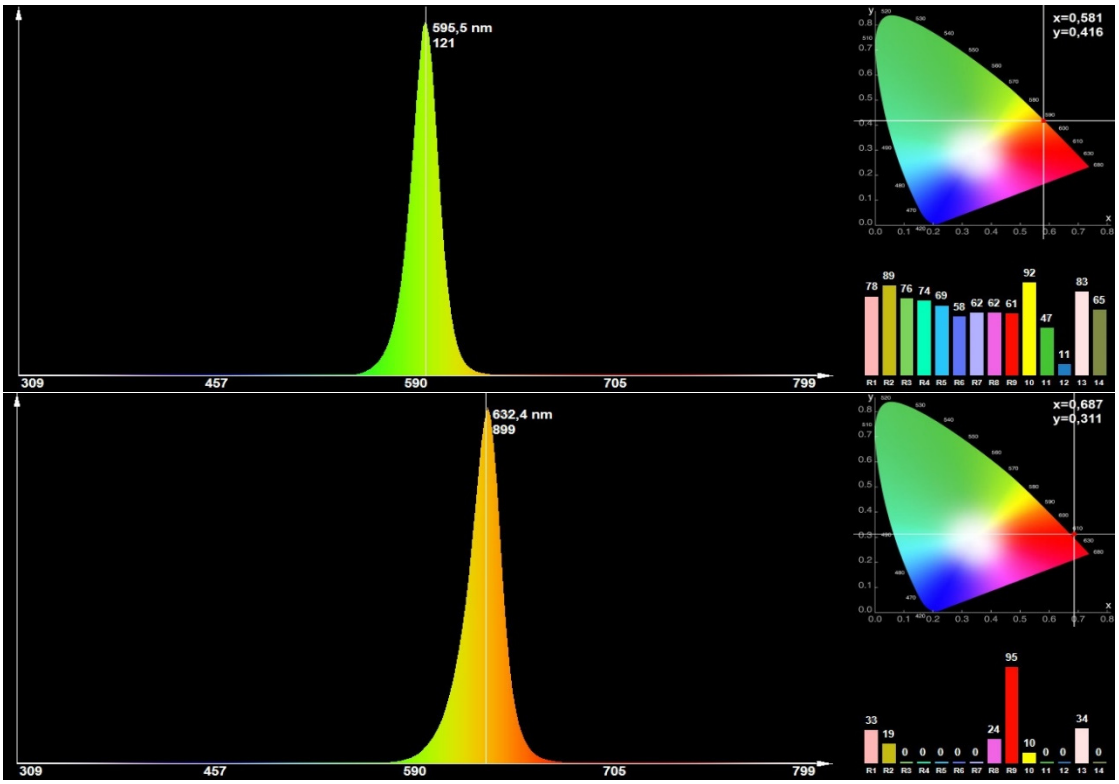



**Figure S18.** Emission spectra of monochromatic light sources - based on LED distributor data.