

## ESI

### **Laser-driven heterogeneous catalysis at room temperature: efficient formation of amides from aldehydes and amines**

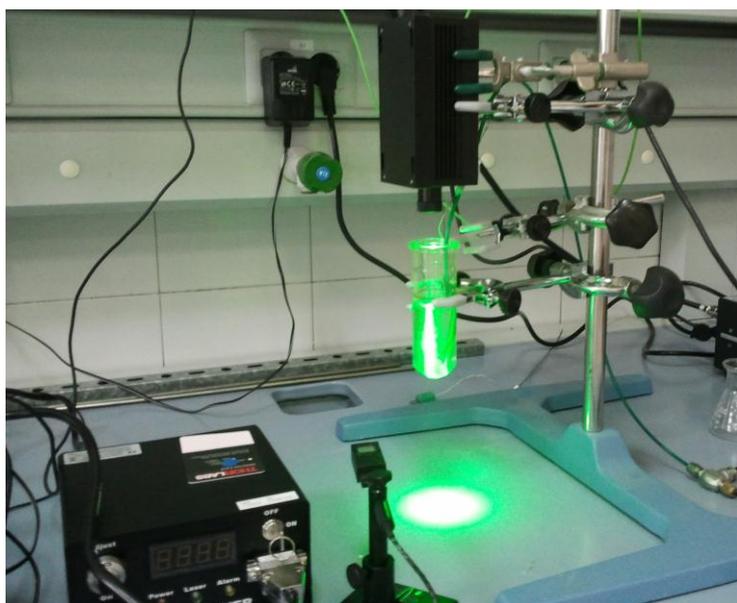
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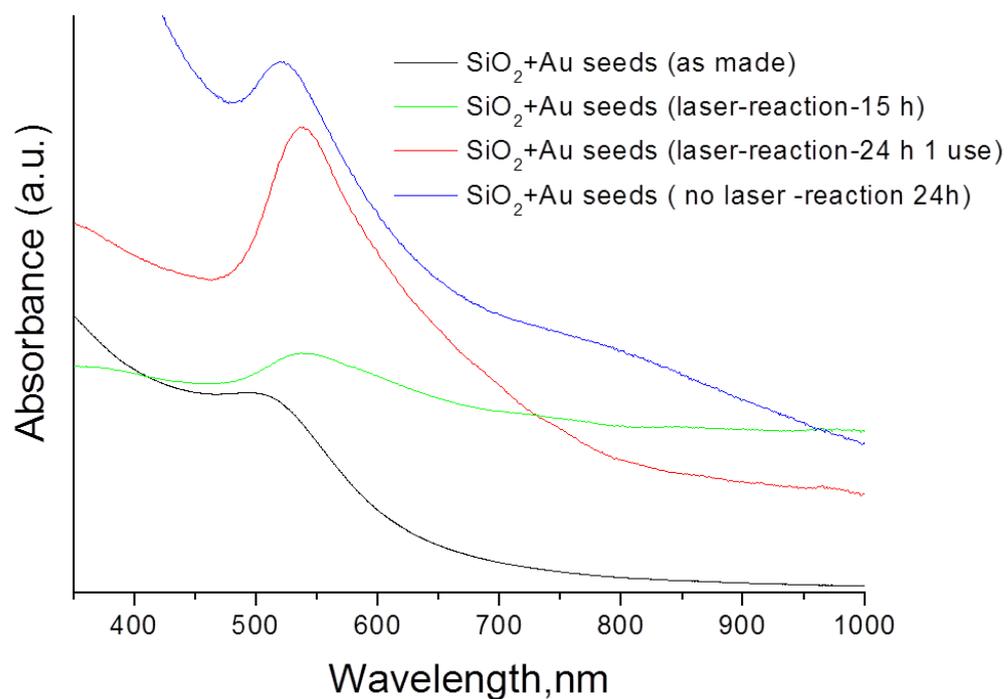
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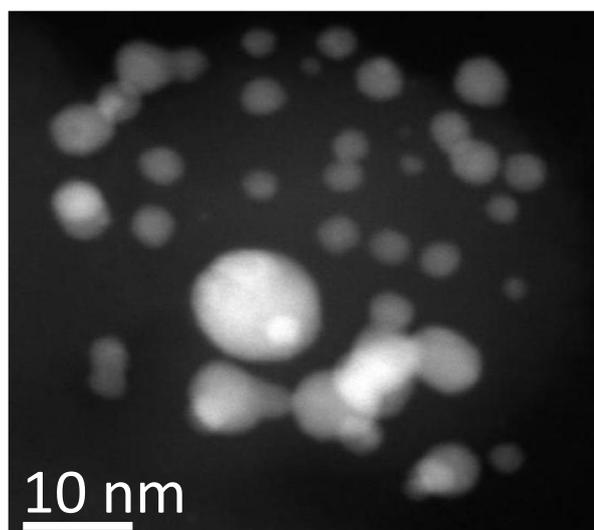
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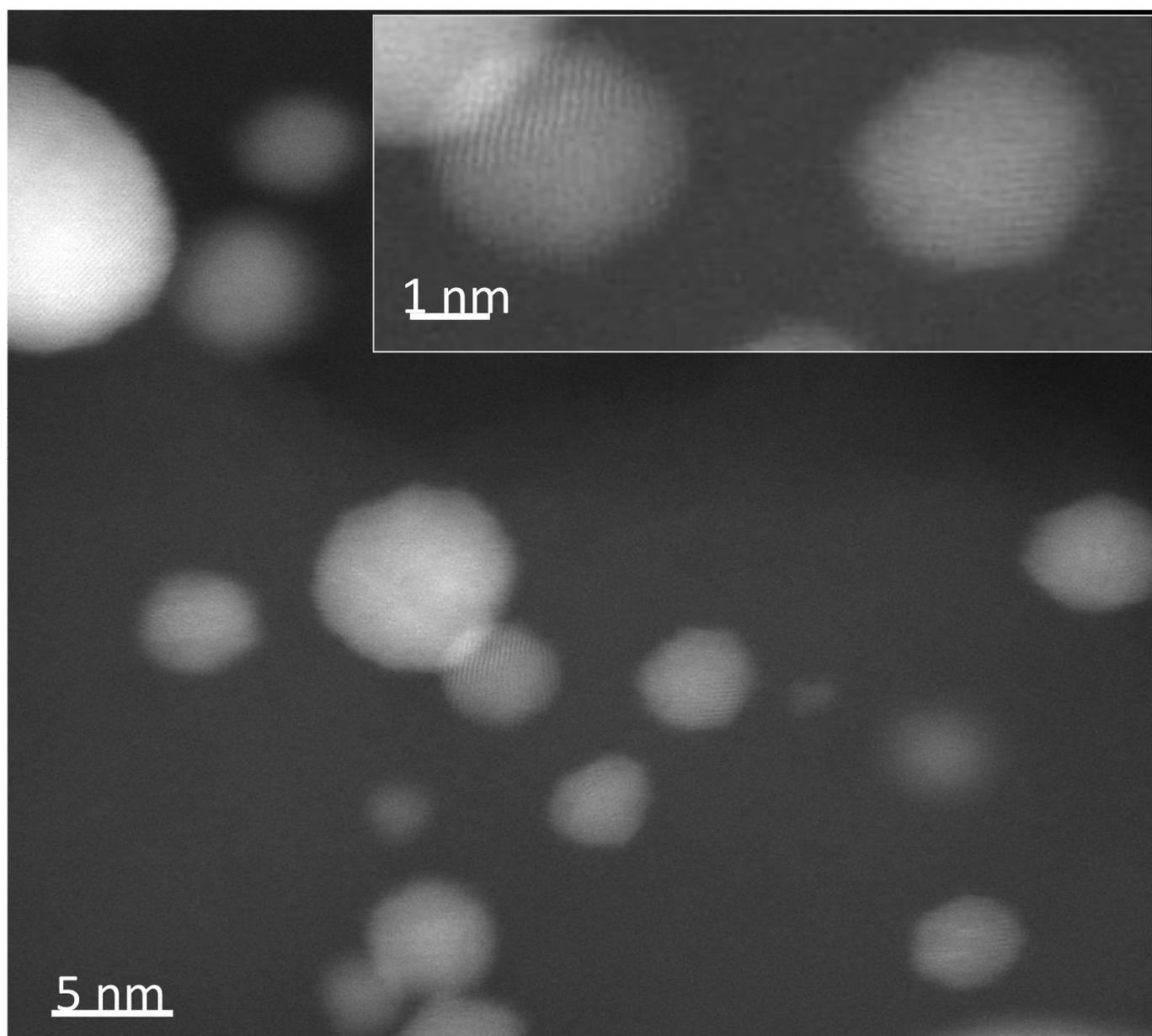
**Figure 1S. Representation of the setup for the RT-laser driven experiments.**



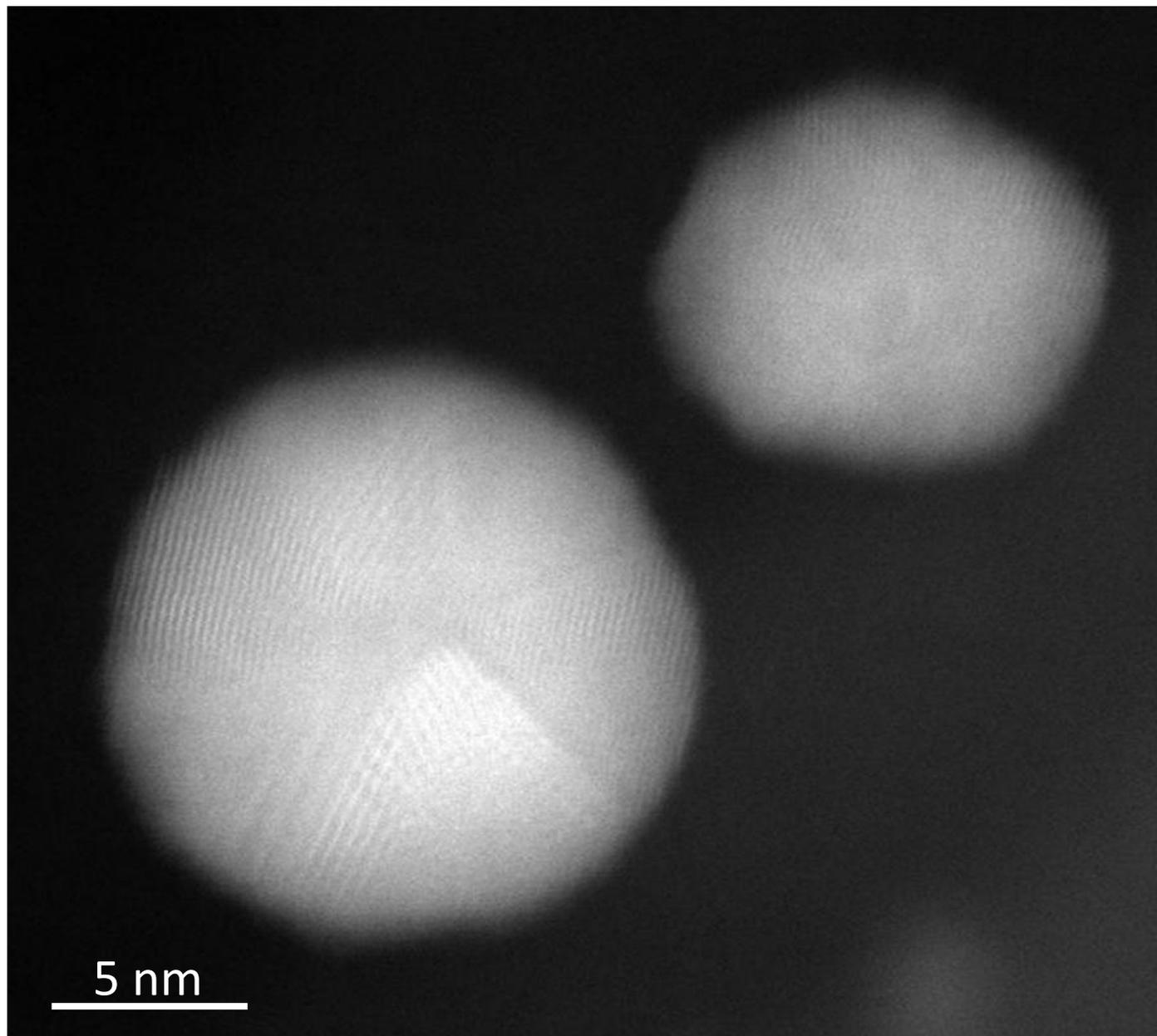
**Figure 2S.** UV-Vis of Au/SiO<sub>2</sub> materials used as catalysts before and after reaction, showing the surface plasmon is present in reused materials. Absorbance intensities are not concentration normalized.



**Figure 3S.** High Resolution from the inset of Figure 3b where some Au NP aggregation is shown.



**Figure 4S. HAADF-STEM images of a second reused Au/SiO<sub>2</sub> materials where Au NPs are imaged as bright spots.**



**Figure 5S. High resolution HAADF-STEM image of a second-reused Au/SiO<sub>2</sub> (from Figure 4S)**

Energy measurements were conducted using 230V 16A energy counter perel (ref. E305EM5-G, see image below) available commercially. Comparable experiments at 5h were measured for the continuous laser assisted process and an analogous experiment at 60°C in a hot plate (650 W).



**Videos representing the stress wave generation and bubble/shockwave formation in the course of the organic reaction during laser excitation as separated files**