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## **Supporting Information**

A simple one-step procedure to gold nanostars in concentrated aqueous surfactant solutions Ferenc Liebig<sup>a</sup>, Ricky Henning<sup>a</sup>, Radwan M. Sarhan<sup>b,c,d</sup>, Claudia Prietzel<sup>a</sup>, Clemens N.Z. Schmitt<sup>e</sup>, Matias Bargheer<sup>b</sup>, Joachim Koetz<sup>a,\*</sup>

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Fig. S1 Absorption spectra of SDS stabilized AuNSs and corresponding TEM micrograph.



**Fig. S2** TEM micrographs of AOT-BDAC stabilized AuNSs at different BDAC concentration. (A) 0.001 M, (B) 0.005 M, (C) 0.01 M, (D) 0.05 M at lower magnification.



**Fig. S3** Single nanostar TEM micrograph including HRTEM of the spike with corresponding FFT pattern of the marked square area.



Fig. S4 Dark field TEM micrograph of an AuNS-spike with the corresponding EDX spectrum



Fig. S5 Raman spectra at a low 4-NTP concentration (10<sup>-6</sup> M) in dependence on the integration time