Electronic Supplementary Material (ESI) for RSC Advances.

Electronic Supplementary Information

Sulfur-Oleyl Amine Platelet Derivatives with Liquid Crystalline Behavior

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In the Supporting Information section were presented the detailed synthetic procedure, the optical images of the S-OA platelet derivatives precipitate from the elemental sulfur in oleyl amine solutions, additional XRD, TEM and AFM data as well FT-IR spectroscopy characterization.

500 mg of elemental sulfur (Aldrich, reagent grade) were added in 5 ml of oleyl amine (Aldrich > 98% primary amine) in a 20 ml vial. Elemental sulfur reagent was used as received without any further purification, while oleyl amine was degassed at 120-130 ^{o}C with nitrogen for 4 h in order to remove humidity and dissolved oxygen. The sulfur oleyl amine mixture was magnetically stirred overnight at 80-100 °C. Any undissolved material was discarded and the clear dark red solution was stored at room temperature in a dark place until a goldish precipitate was formed. This procedure takes at least 3 months. The precipitate was collected by discarding the supernatant and washed by hexane. The washed S-OA derivative was finally dispersed in hexane or in toluene and stored in a dark place in a vial under nitrogen blanket.

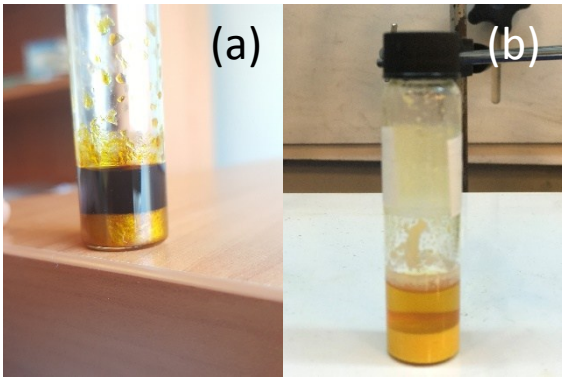

Figure S1. Optical images of sulfur-oleyl amine (S-OA) platelet derivative precipitated after 3 months from a concentrated (80 mg/mL) sulfur in oleyl amine solution (a), S-OA in hexane (b).

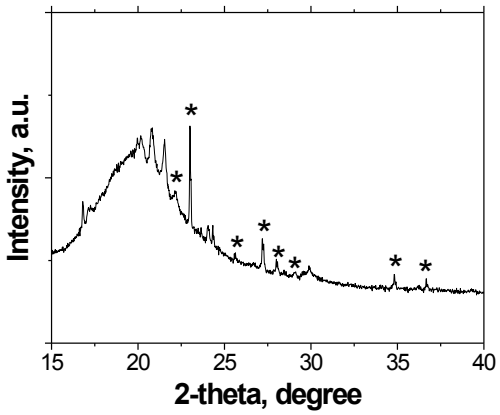

Figure S2. XRD pattern of S-OA platelet derivative.

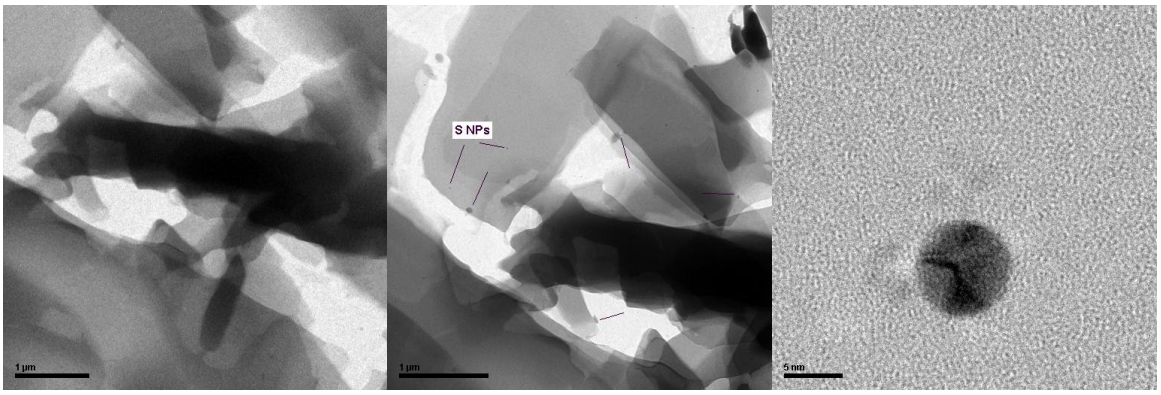

Figure S3. TEM images of sulfur-oleyl amine platelet derivative and a sulfur nanoparticle.

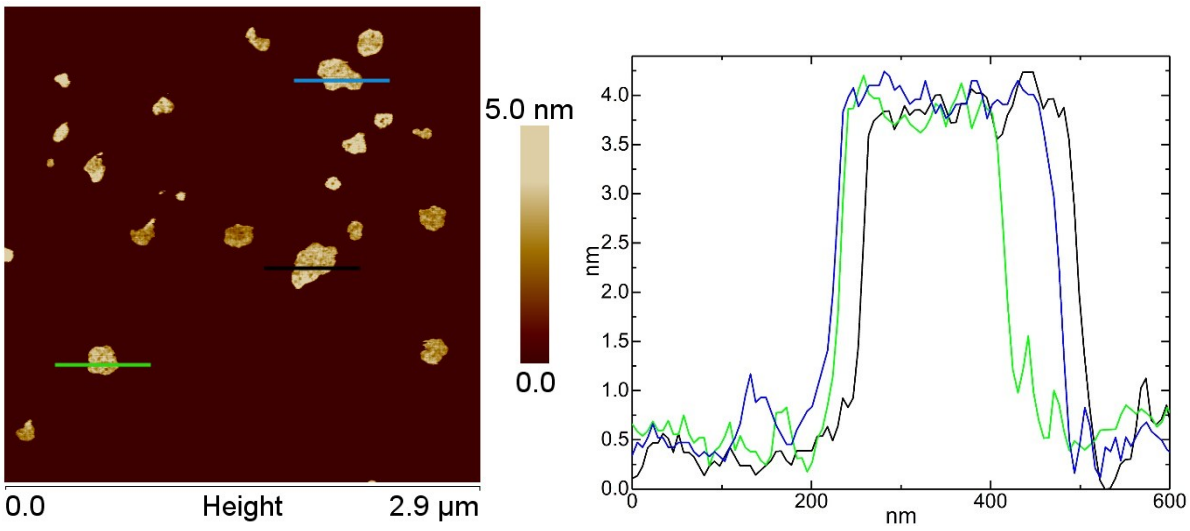

Figure S4. AFM height image and corresponding section analysis of sulfur-oleyl amine platelet derivative.

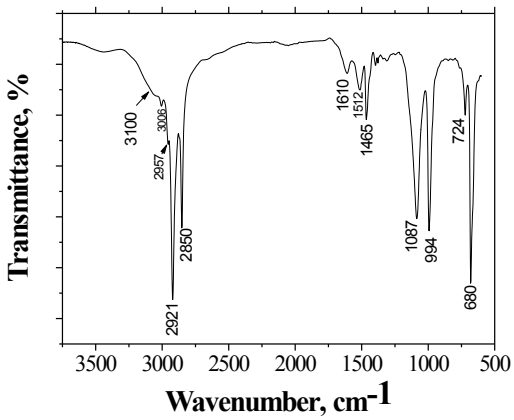

Figure S5. FT-IR spectrum of S-OA platelet derivative.

The FT-IR spectrum shows strong absorptions at 2925 and 2855 cm^{-1} due to the -CH_2- stretching absorption (symmetric and asymmetric) of the aliphatic chains, whereas a weak peak at 3006 cm^{-1} is characteristic of the cis–HC=CH– arrangement in the oleyl amine molecule. The broad weak band around 3400 cm^{-1} arises from the stretching vibration of the NH_2 group of unbonded, free oleyl amine (probably physisorbed on the surface of the S-OA platelets), while the shifted broad band around 3100 cm^{-1} indicates that most of the oleyl amine molecules interact via the NH_2 group.