

Supplementary Information

Sucrose-responsive Intercommunicated Janus Nanoparticles Network

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1. Materials and Methods

1.1 Ensemble of the nanomachine: J1c

1.1.2 Synthesis of mono-6- Iodine-desoxi cyclodextrin (β -CD-I)

For the synthesis of mono-6- Iodine-desoxi cyclodextrin (β -CD-I), previously reported methods have been used.[1,2] Briefly, 1.5 g (1 mmol) of mono-6-O-(p-toluenesulfonyl)-beta-cyclodextrin (β -CD-Ts) previously synthesized[3] and 1.75 g (12 mmol) of NaI are dissolved in anhydrous DMF under inert atmosphere. The mix is heated under reflux with magnetic stirring for 5 hours. Then, the solvent is removed under reduced pressure and the product precipitates as a white solid after the addition of 50 mL of acetone. The solid product is filtered and washed several times with acetone and finally is dissolved in the least amount of water to, subsequently, precipitate it again with acetone. Finally, the solid obtained, β -CD-I, is vacuum filtered and washed with acetone being storage under vacuum.

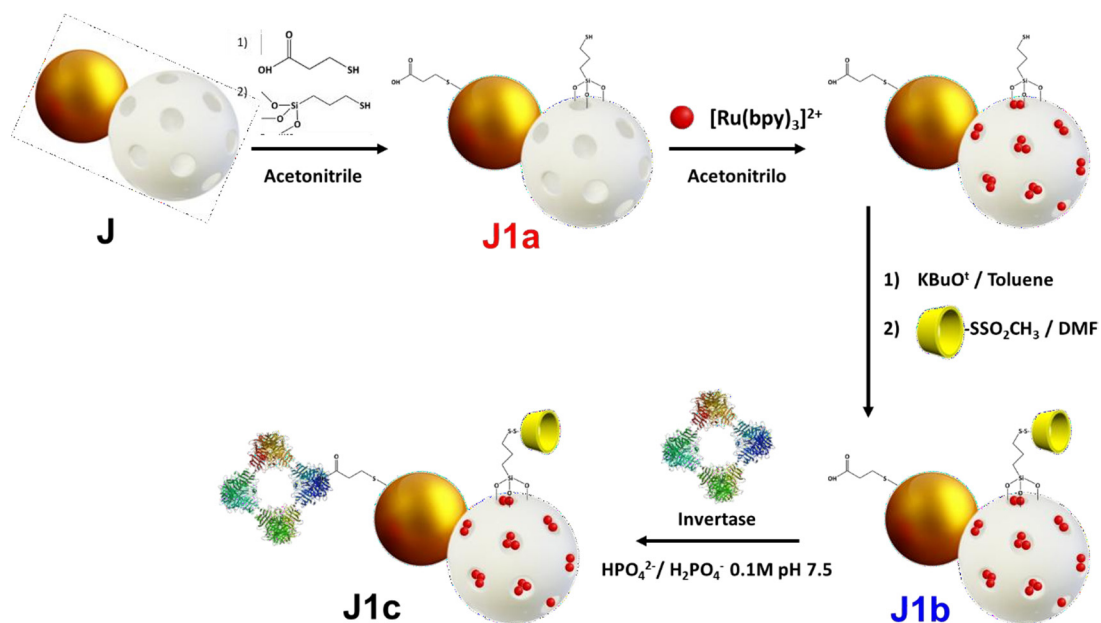
The resulting yield was: 1.24 g, 87 %.

1.1.2 Synthesis of methanethiosulfonate de 5-(6-desoxi- β -cyclodextrin) (β -CD- SSO₂CH₃)

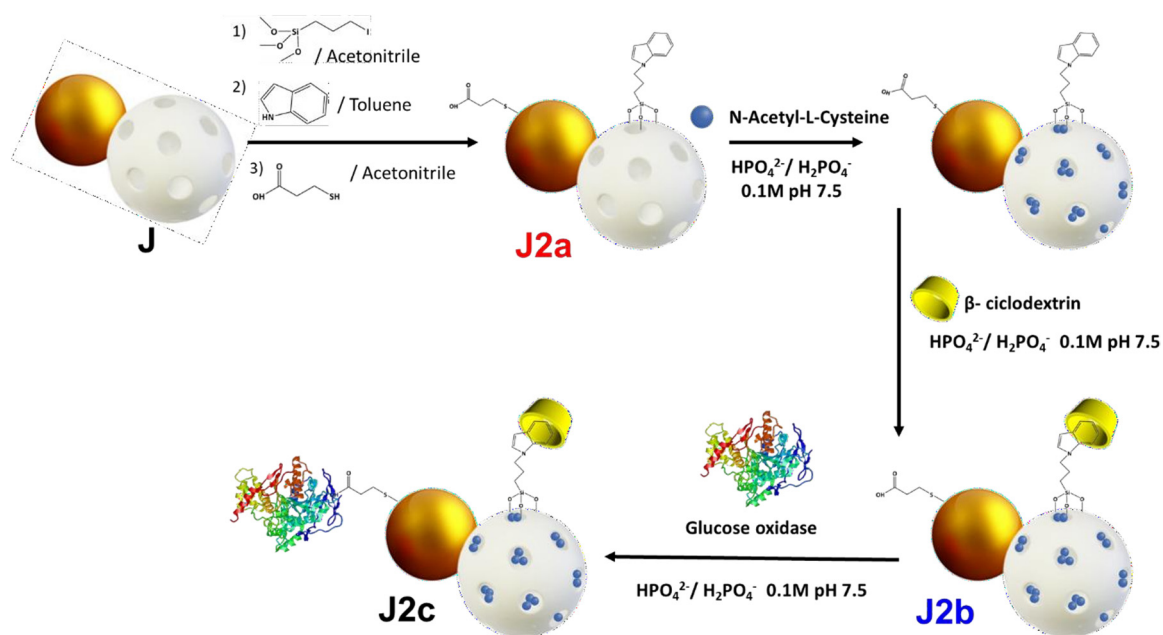
For the synthesis of methanethiosulfonate de 5-(6-desoxi- β -cyclodextrin) (β -CD- SSO₂CH₃), previously reported methods have been employed.[1,2] Briefly, 0.5 g of β -CD-I (0.4 mmol) and 72 mg of NaSSO₂CH₃ (0.5 mmol) were dissolved in 5 mL of DMF under Ar atmosphere using a 25 mL round bottom flask with two necks. The mix was stirred and heated at 50 °C for 24 hours. Afterwards, the solvent is removed under reduced pressure and the product precipitates as a white solid after the addition of ethanol. The solid is vacuum filtered and washed several times using a filter plate being storage under vacuum.

The resulting yield was: 0.41 g, 82 %.

1.2 Schematic representation of the preparation of both nanomachines: J1c and J2c



Scheme S1. Preparation steps for J1c.



Scheme S2. Preparation steps for J2c.

2. Results and Discussion

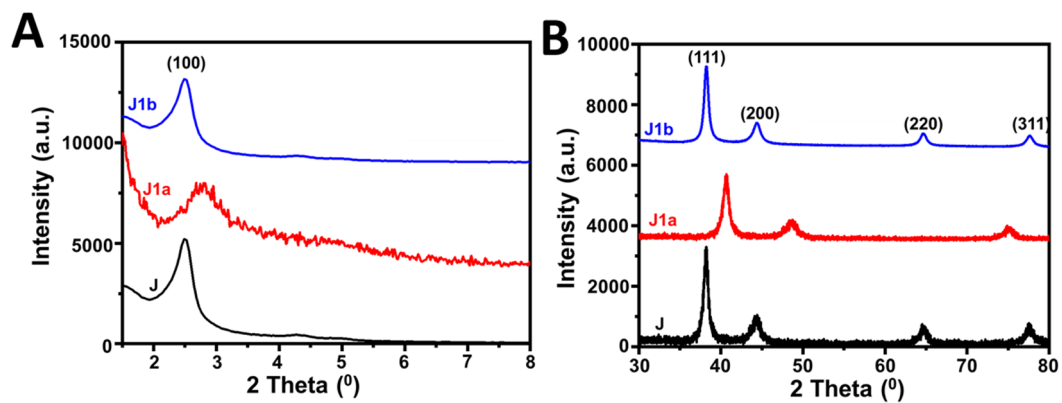


Figure S1. Powder X-ray diffraction patterns of the solids J, J1a y J1b at low (A) and high (B) angles.

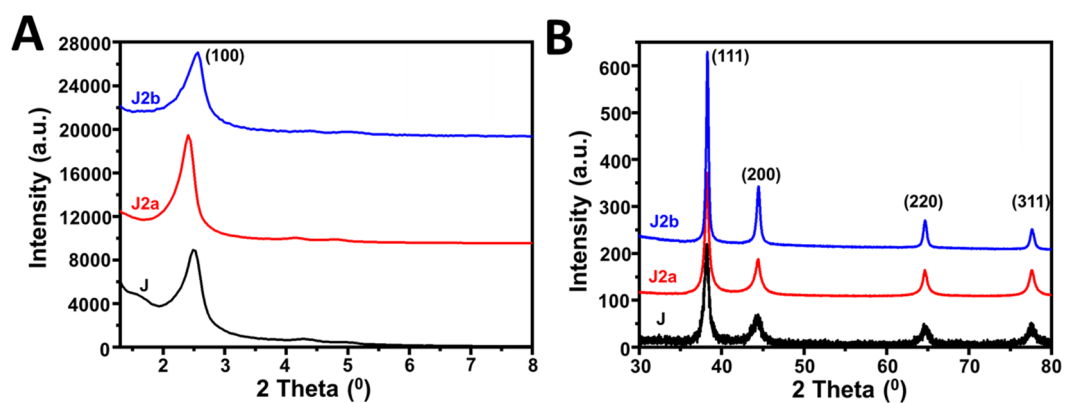


Figure S2. Powder X-ray diffraction patterns of the solids J, J2a y J2b at low (A) and high (B) angles.